AL/CF-TR-1995-0171

# STATUS REPORT ON MEDICAL MATERIEL ITEMS TESTED AND EVALUATED FOR USE IN THE USAF AEROMEDICAL EVACUATION SYSTEM

Systems Research Branch

CREW SYSTEMS DIRECTORATE
Crew Technology Division
2504 Gillingham Drive, Suite 25
Brooks Air Force Base, TX 78235-5104

March 1996

Interim Technical Report for Period October 1991-December 1995





AIR FORCE MATERIEL COMMAND
BROOKS AIR FORCE BASE, TEXAS

ARMSTRONG LABORATORY

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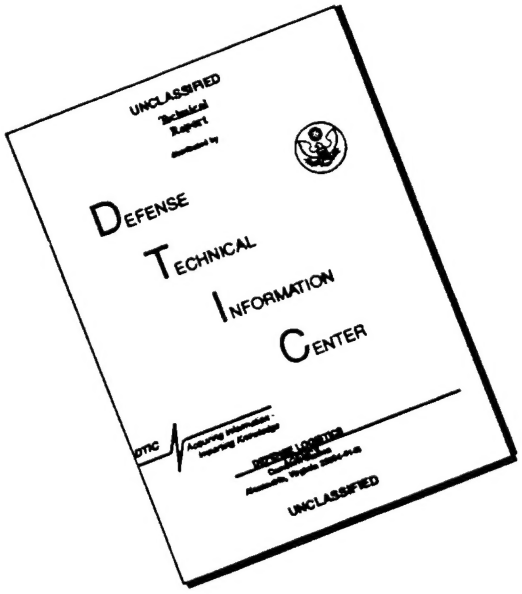


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The Office of Public Affairs has reviewed this report, and it is releasable to the National Technical Information Service, where it will be available to the general public, including foreign nationals.

This report has been reviewed and is approved for publication.

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13. ABSTRACT *(Maximum 200 words)*
The medical equipment items contained in this report were tested/evaluated/developed primarily for use in the United States Air Force aeromedical evacuation system. The acceptable/conditional/unacceptable designations apply only to the routine use of a particular piece of equipment in the unique aeromedical evacuation environment of the Department of Defense and are not intended as representation to be relied upon by persons or entities outside the Department of Defense.

14. SUBJECT TERMS
Airevac Equipment, Aeromedical Equipment, Cardiac, Infusion, Respirators, Ventilators, Suction Equipment, Incubators, Pulse Oximeters, Air and Oxygen Equipment, Power, Securing Devices, Miscellaneous Medical Equipment.

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# AEROMEDICAL RESEARCH STATUS GUIDE

## CATEGORIES

- AIR AND OXYGEN
- CARDIAC
- INCUBATORS
- INFUSION
- MISCELLANEOUS
- POWER
- PULSE OXIMETERS
- RESPIRATORY
- SECURING
- SUCTION
- VENTILATORS

## CLASSIFICATION

ACCEPTABLE

CONDITIONAL

UNACCEPTABLE

### Definitions of Equipment Classifications

| | |
|---|---|
| **ACCEPTABLE** | - the equipment is approved for use on large-bodied United States Air Force aeromedical evacuation aircraft |
| **CONDITIONAL** | - the equipment is approved for use on large-bodied United States Air Force aeromedical evacuation aircraft only when specific operational restrictions are met |
| **UNACCEPTABLE** | - the equipment is not approved for use on any United States Air Force aeromedical evacuation aircraft |

In the past, airworthiness evaluations involved only the large-bodied Unites States Air Force cargo aircraft specifically designated for aeromedical evacuation. More recently, the smaller bodied aircraft such as the C-12, C-21, C-26, and C-27 have joined the aeromedical evacuation inventory, and Aeromedical Research has adjusted testing procedures to accommodate these additional airframes. In order to ensure the sage operation of previosly approved equipment in the smaller aircraft, Aeromedical Research must examine the electromagnetic interference data of the initial evaluation. This process has begun, and a preliminary list of equipment approved for the smaller aircraft is available.

CONDITIONAL

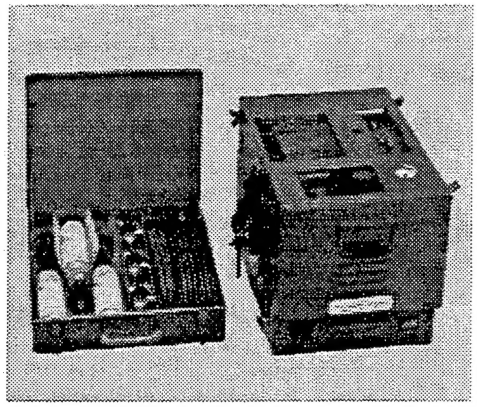
AIR & OXYGEN

# 10-LITER PATIENT THERAPEUTIC LIQUID OXYGEN CONVERTER (PT LOX), MODEL CRU-87/U

Essex Cryogenics of Missouri, Inc.
8007 Chivvis Dr.
St. Louis, MO 63123-2395
(314) 832-8077

**Evaluation Date:** January 1 1987

**Description:** The PT Lox, which stores up to 10 liters of liquid oxygen, was designed to deliver therapeutic gaseous oxygen at 15 lpm, for up to three patients. A converter changes the liquid oxygen to its gaseous state, which is then passed through two heat exchangers that elevate the delivery temperature to 15.5 to 26.6 degrees C (60 to 80 degrees F). A pressure regulator reduces the gas pressure to 50±5 psi before it reaches the three supply outlets, located on the upper surface of the container assembly. Ten liters will provide oxygen at 15 lpm to 3 patients for approximately 3 hours.



**Power Requirements:** One 9 volt battery to provide power to LCD.

**Comments:** Humidifiers, oxygen monitors, and pulse oximeters should always be used in administering oxygen. During follow-up testing we found the PT LOX can be used to deliver oxygen to four patients (using a Y-connector) up to 15 lpm each, for a total of 60 lpm. The flowmeters require 50 psi to give an accurate flow, and the flowmeters provided with the PT LOX have no indicator of flow actually being delivered. For this reason, it is recommended that when more than three patients are being serviced, and /or flow exceeds 45 lpm, the patients should be monitored with pulse oximeters to ensure they are adequately oxygenated. It is also recommended that, when using Y-connectors or flowrates above 45 lpm, a flowmeter (such as the Ohio/Ohmeda) be used. This will insure that a decrease in flow will be readily noticeable. Ventilators use oxygen in different manners. Ventilators that do not need a 50 psi source and have flow rates less than 65 lpm can be safely used with the PT LOX. Ventilators that need a 50 psi source should operate, if they do not require flow rates above 45 lpm.

CONDITIONAL

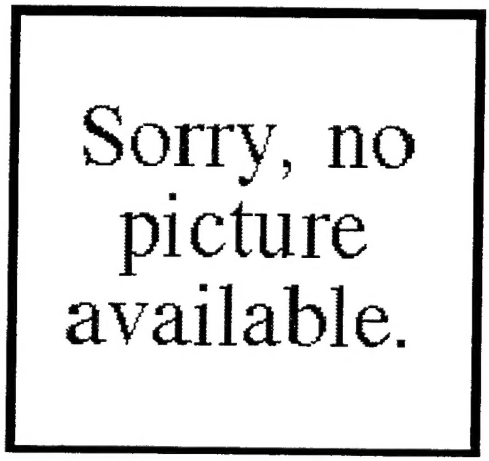
AIR & OXYGEN

# AERO-WEST AEROSOL DISPENSER WITH "DEAR JOHN" AEROSOL MODEL 510H-15

West Chemical Products, Inc.
5439 Highland Park Drive
St. Louis, Missouri 63110

**Evaluation Date:** June 1 1970

**Description:** Not available in record.




**Power Requirements:** 110 VAC 60 Hz

**Comments:** The Aero-West Model 510H-15 aerosol dispenser with "Dear John" Aerosol is acceptable for use on the C-141 in the latrine of the comfort pallet using the razor outlet. If the dispenser is to be used in other than the razor outlet, modifications are required to make this unit acceptable. Those modifications: (1) Replacement of the two wire line cord with a three wire system; (2) grounding the chassis of the unit; (3) fusing the unit's electrical system. An "on-off" indicator and switch are desirable but are not essential features.

CONDITIONAL

## AIR & OXYGEN

# AQUAPAK NEBULIZER MODEL 500, WITH ADAPTER 021 AND AQUATHERM HEATING UNIT 091

Respiratory Care Inc.
2420 E. Oakton
Arlington Heights, IL 60005
(312) 259-7400

**Evaluation Date:** December 1 1974

**Description:** Aquatherm internally heats mist for aerosol to approximate body temp. There is no internal heating rod to carry contaminants into sterile water/saline reservoir. It self-sterilizes in 5 minutes with a start up time just 2 minutes. A special Reed ground-detector lights when unit is inverted, plus thermostat and an on-off indicator. A clear plastic wall plug allows for quick visual inspection. An adjustable entrainment collar has settings for 45%, 70% and 85%. A built in STF filter traps airborne particulate matter. The return tubes drain runs out the back into a bottle to eliminates flooding. The nebulizer works with or without heater and is completely disposable.

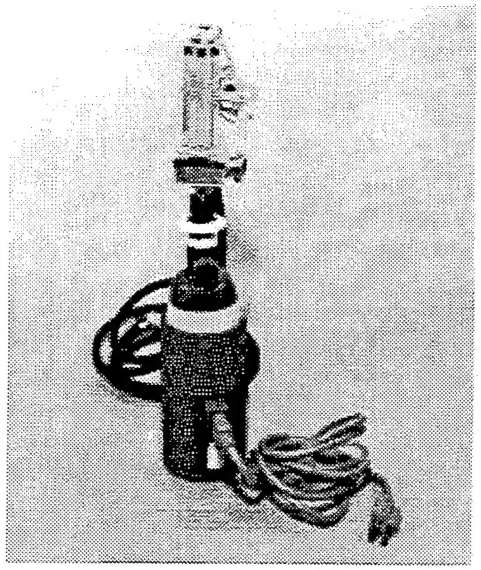
**Power Requirements:** 115 VAC 50 - 400 Hz

**Comments:** The Aquapak Nebulizer Model 500 emissions exceed the radiated and conducted emission limits as specified by MIL-STD-461A. The Aquapak Nebulizer with the Aquatherm Heater may be used on or near an electrically susceptible patient without danger of exposing the patient to leakage current. When the Aquapak Nebulizer is disassembled, metal parts of the Aquatherm Unit are exposed. If the third wire (ground) or outlet ground is disconnected, broken, or has a high-resistance continuity, leakage current is present and becomes exceedingly high when the heater is inverted.

Waiver for EMC deficiency has been granted by ASC/ENACE, Wright-Patterson AFB, Ohio, 6 Nov. 74.

| ACCEPTABLE | AIR & OXYGEN |
|---|---|
| **BARD-PARKER NEBULIZER HEATER JACKET** | **Seamless-Dart Respiratory** |

**Evaluation Date:** October 1 1978 & January 1 1980



**Description:** Not available in record.

**Power Requirements:** 115 VAC 60 - 400 Hz

**Comments:** Electromagnetic Compatibility was the only test conducted. The unit was operated on 115 VAC 60 Hz, and connected to a flow meter set a 5 LPM, the mist temperature exiting a 36-inch (91.3 cm) corrugated tubing stabilized at 89 degrees F (31.7 degrees C). The flow rate was increased to 10 LPM and the temperature stabilized at 86.4 degrees F (30.2 degrees C). With the unit operating on 115 VAC 400 Hz, and the flow meter set at 10 LPM, it stabilized at 88.8 degrees F (31.6 degrees C). Based on these results, the unit is acceptable for use onboard aeromedical evacuation aircraft.

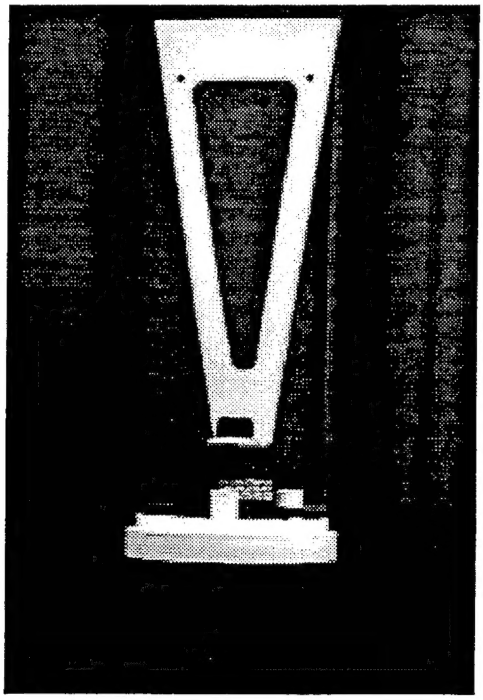
# UNACCEPTABLE

## AIR & OXYGEN

## BENNETT CASCADE HUMIDIFIER, MODEL 1900

**Puritan Bennett Corporation**
**10th & Harrison Berkeley, CA 94710**
**(213) 390-8565**

**Evaluation Date:** December 1 1975



**Description:** The Bennett Cascade Humidifier, provides a means of maintaining high levels of humidity. It adapts to the Bennett MA-1 Volume ventilator. The cascade employs an adjustable thermostatically controlled electric heater to raise the temperature of the water and gas which bubbles through it. The immersion heating element is doubly encased in metal. The externally adjustable thermostat control allows easy control of temperature. An internal shut-off switch helps to reduce the possibility of burns if the heating element is withdrawn from the reservoir.

**Power Requirements:** 115 VAC 60 Hz

**Comments:** The cascade is not acceptable for use onboard aeromedical airlift aircraft. During on/off operation of the heater thermostat, it exceeds radiated and conducted emission limits as specified by MIL-STD-461A.

| ACCEPTABLE | AIR & OXYGEN |
|---|---|
| **BIOMARINE HIGH HUMIDITY ADAPTER** | **BioMarine Industries<br>Pennsylvania, 19333<br>(215) 647-7200** |

**Evaluation Date:** August 1 1976

**Description:** Not available in record

Sorry, no picture available.

**Power Requirements:** None

**Comments:** Relative Humidity testing - 65% at 95 degrees F was the only test conducted. Packaged with the BioMarine Oxygen Analyzer, Model 202R sensor.

# ACCEPTABLE

## AIR & OXYGEN

## BIOMARINE OXYGEN ANALYZER, MODEL OA202R

**BioMarine Industries**
**303 West Lancaster Ave**
**Devon, PA 19333**
**(215) 647-7200**

**Evaluation Date:** September 1 1972

**Description:** The oxygen analyzer consists of a 2" x 2 1/2" x 5" housing with a meter to display the sensor output either in percent oxygen or oxygen partial pressure in millimeters of mercury (P02 mmHg). A remote detachable oxygen sensor plugs into a jack located on the unit. A recessed slotted screw is available for calibrating the unit. This unit operates on the principal of oxygen being sensed directly by a BioMarine Industries galvanic cell containing a gold cathode and a lead anode in a basic electrolyte. The entire cell is encapsulated in inert plastic. The sensor face is a fluoro-carbon polymer. Oxygen diffusing through the cell face initiates redox reactions which generate a minute current proportional to oxygen partial pressure. A temperature compensated circuit converts the current to a proportional voltage which is displayed directly on the meter face as oxygen partial pressure in millimeters of mercury (mmHg). The oxygen analyzer normally comes with the meter scale in percent oxygen. The unit may be obtained with the meter scale in mmHg (oxygen partial pressure) if requested at the time an order is placed.


**Power Requirements:** None

**Comments:** The purchase order should request that the meter display PO2 in mmHg and that the sensor is for high altitude use.

# ACCEPTABLE

**AIR & OXYGEN**

## BIOMARINE OXYGEN MONITOR/CONTROLLER, MODEL 400

**Rexnord-Electronic Products Division**
**(215) 647-7200**

**Evaluation Date:** September 1 1972

**Description:** The BioMarine OMC 400 continuously analyzes, monitors, and controls the oxygen level in incubator, head hood, or tent. The prescribed oxygen level is dialed in, and an audio/visual alarm activates if the oxygen level deviation is 15% or more. This will occur if there is incubator or oxygen supply failure. The unit is easily connected to an oxygen cylinder or piped oxygen outlet. The unit should measure partial pressure of oxygen, not percentage.

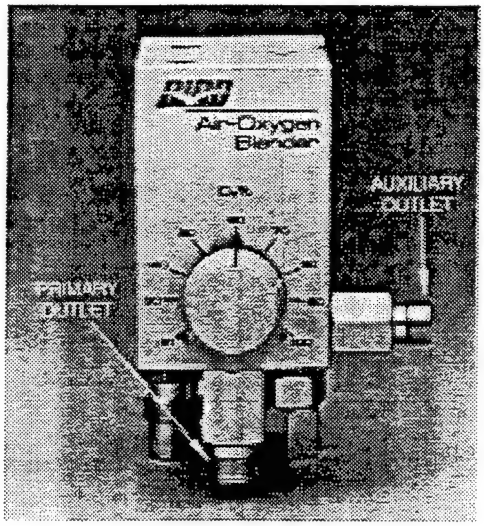
Sorry, no picture available.

**Power Requirements:** Not recorded.

**Comments:** None

| ACCEPTABLE | AIR & OXYGEN |
|---|---|
| **BIRD AIR-OXYGEN MICROBLENDER, MODEL 3800A** | **Bird Products Corp.**<br>**1100 Bird Center Drive**<br>**Palm Springs, CA 92262**<br>**(800) 328-4139** |
| **Evaluation Date:** April 1 1990 | |

**Description:** This device blends compressed air and medical grade oxygen for delivery to a ventilator at 50 psi (±5); at percentages determined by the blender control knob; from 21 to 100%. There is also an auxiliary outlet for attaching a flow meter to supply oxygen to a manual resuscitator, and other low-flow applications.




**Power Requirements:** Pnuematically driven. For optimum efficiency use compressed air at 50 psi and Oxygen at 50 psi.

**Comments:** The Model 3800A was evaluated as a component of the International Biomedical Neonatal Transport System. The 3800A may be used outside of or as part of the Neonatal Transport System. The device may be utilized with free flow oxygen administration, mechanical ventilation of adults, pediatrics, and neonates, continuous positive airway pressure, and a combination of mechanical ventilation/free flow oxygen administration. Following significant changes of altitude, it will be necessary to adjust the blender setting to deliver the same partial pressure of oxygen as that delivered at the previous altitude, as indicated by an oxygen analyzer.

| ACCEPTABLE | AIR & OXYGEN |
|---|---|
| **BIRD FREE FLOW HUMIDIFICATION KIT** | **Bird Products Corp.**<br>**1100 Bird Center Drive**<br>**Palm Springs, CA 92262**<br>**(800) 328-4139** |

**Evaluation Date:** January 1 1972

**Description:** The Bird free flow humidification kit provides for direct humidification of all metered free flow gases. It is a universal, long-term, multifunction humidifier-nebulizer.

Sorry, no picture available.

**Power Requirements:** Not recorded

**Comments:** None

# UNACCEPTABLE

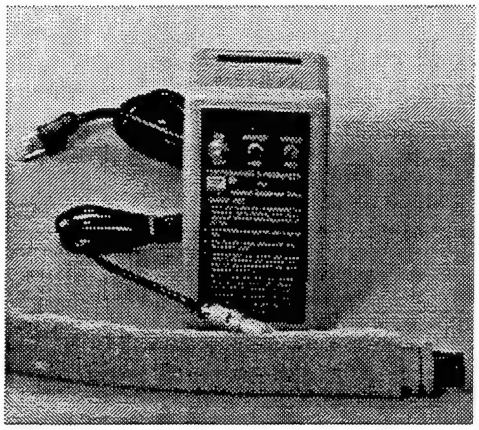
**AIR & OXYGEN**

## BIRD HEATER NEBULIZER TUBE (PROTOTYPE), P/N 6851 BIRD TEMPERATURE CONTROLLER, P/N 6852, S/N P108

**Bird Products Corp.**
**1100 Bird Center Drive**
**Palm Springs, CA 92262**
**(800) 328-4139**

**Evaluation Date:** July 1 1977

**Description:** The Bird heated nebulizer tube and the Bird temperature controller, is designed to be used with any piece of equipment which delivers air or mist without having to make any adjustments to the temperature controller or heated tube. It is designed to maintain a temperature of 37 degrees C (98.6 degrees ±2 degrees F) at the proximal end of the tube.



**Power Requirements:** 115 VAC, 60 Hz, 1.5 amp to operate temperature controller.

**Comments:** Failed vibration, Environmental and altitude testing.

| UNACCEPTABLE | AIR & OXYGEN |
|---|---|
| **BIRD IMMERSION HEATER** | **Bird Products Corp.**<br>**1100 Bird Center Drive**<br>**Palm Springs, CA 92262**<br>**(800) 328-4139** |

**Evaluation Date:** April 19 1972

**Description:** Not available in record

Sorry, no picture available.

**Power Requirements:** Not recorded

**Comments:** Failed safety requirements.

# ACCEPTABLE

**AIR & OXYGEN**

## BLOUNT INHALATION THERAPY EQUIPMENT - TWIN-O-VAC, MIST-VIVA RESPIRATOR, OXYGEN-FLOWMETER, HUMIDIFIER

**Blount, Inc.**
**1031 Industrial Drive**
**Santa Rosa, CA 95406**
**(707) 544-5171**

**Evaluation Date:** August 1 1972

**Description:** Twin-O-VAC, Model 3100, is a unit specially designed to provide facilities for resuscitation, suction and oxygen therapy quickly and efficiently without having to change leads, connections, or fittings.

Oxygen Flowmeter, Model 3700 is a Pressure compensated, autoclaveable flowmeter. Liter flow is calibrated by even numbers 2 through 14.

Mist-Viva Respiratory, Model 3500 - The Mist-Viva nebulizes medication and is used for treatment of respiratory lung disease. It offers a choice of either 30 or 60 liters flow rate is available.

Humidifier, Model 3750 - The Humidifier is used to add water vapor to the dry oxygen to prevent drying out of the patient's airway.

Sorry, no picture available.

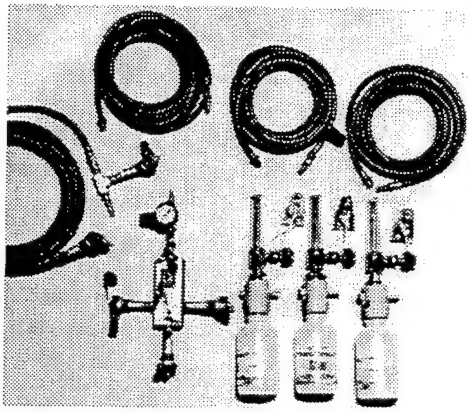
**Power Requirements:** Not recorded

**Comments:** The oxygen flowmeters showed increased inaccuracies at altitude. At ground level, the flowmeters indicated flow rate was greater than the measured flow rate by as much as 11%. At a 4,000 ft equivalent altitude, the flowmeters indicated flow rate was less than the measured flow rate by as much as 46%. The Blount Inhalation Therapy Equipment will need adjustments during flight to correct inaccuracies caused by changes in altitude.

| ACCEPTABLE | AIR & OXYGEN |
|---|---|
| **C-141 THERAPEUTIC OXYGEN MANIFOLD DISTRIBUTION SYSTEM (TOMS)** | **USAF contract** |

**Evaluation Date:** September 1 1972 & June 1 1974

**Description:** The C-141 Oxygen Manifold Distribution System is a simple, three-outlet manifold, with a reduction valve set at 50 psi, which can be easily connected by hose to one of the aft recharger hoses on the therapeutic LOX system. The manifold can be attached to any of the center litter-tier-support stanchions by two quick-release pins inserted through the manifold into the "Evans Seat" connection holes. Each manifold enables aeromedical crews to administer metered quantities of oxygen, with proper individual patient control and humidification, to as many as three patients simultaneously at any location in the litter section. Three flow meters and humidifier sets are included with each manifold. The capability to recharge portable walk-around oxygen bottles has been retained by including a recharger outlet in the system where it connects to the aircraft recharger system.



**Power Requirements:** None

**Comments:** None

CONDITIONAL

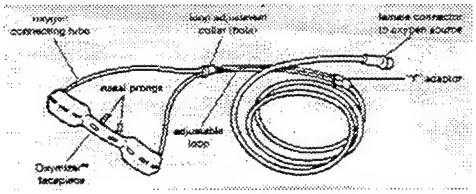
## AIR & OXYGEN

# CHAD OXYMIZER OXYGEN CONSERVING NASAL CANNULA

**CHAD Therapeutics, Inc.**
**6324 Variel Ave, Suite 323**
**Woodland Hills, CA 91367**
**(800) 423-8870 or (818) 882-0883**

**Evaluation Date:** December 1 1986

**Description:** The face piece has a small collapsible reservoir to reduce oxygen flow rate requirements in oxygen dependent patients. The standard nasal cannula systems waste oxygen because they deliver oxygen continuously without regard to inspiratory/expiratory cycles; the oxygen flow during the expiratory cycle is lost to room air. The Oxymizer also uses a continuous oxygen flow; however, during inspiration, the collapsible reservoir provides an additional volume of oxygen, while, during expiration, some of the normally "wasted" oxygen flow refills the reservoir.



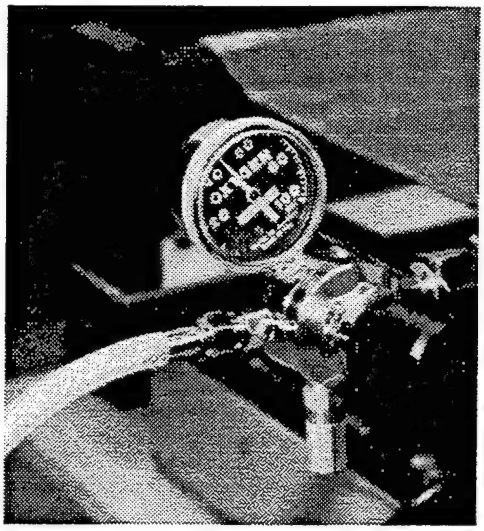

**Power Requirements:** Oxygen source (medical grade, 100%) with adjustable flowmeter and tapered output fitting for cannula attachment.

**Comments:** The Oxymizer requires approximately 40% less oxygen flow than the currently used standard nasal cannula. Therefore, flow rates prescribed for use with a standard nasal cannula must be reduced by approximately 40% when using the Oxymizer. If the user does not reduce the flow rate, the possibility of hyperoxia exists. In the case of Chronic Obstructed Pulmonary Disease (COPD) patients the difference in oxygen consentration could have severe consequences. The Oxymizer is to be used only when specifically requested by the prescribing physician, or in situations where oxygen resources are extremely limited.

| UNACCEPTABLE | AIR & OXYGEN |
|---|---|
| **CONCOA CORPORATION OXYGEN REGULATOR** | **Concoa Corporation** |

**Evaluation Date:** May 19 1989

**Description:** See record for further information.



**Power Requirements:** None

**Comments:** First Article Testing Tested for Defense Personnel Support Center (DPSC) Failed vibration testing.

| ACCEPTABLE | AIR & OXYGEN |
|---|---|
| **DISPOSABLE OXYGEN MASKS, TOMAC BAGLESS, ADULT SIZE, SEFLO UNIVERSAL, TOMAC WITH REBREATHER BAG, ADULT SIZE** | **No Address in Record** |

**Evaluation Date:** January 1 1968

**Description:** Not available in record

Sorry, no picture available.

**Power Requirements:** None

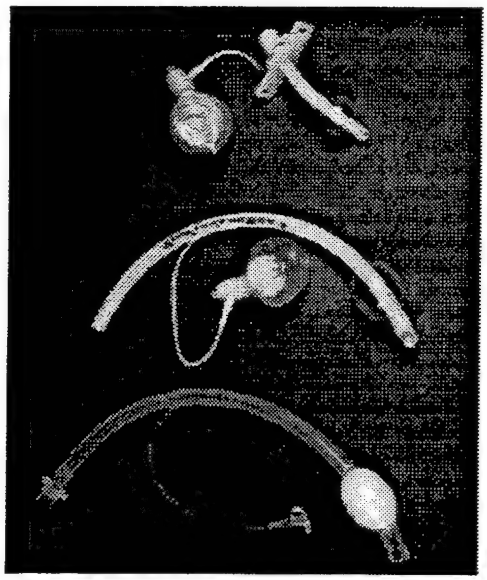
**Comments:** Results indicate the mask with the rebreather bag to be superior to the others tested.

Tomac bagless, Adult size, Catalog # 19300020
Tomac with Rebreather bag, Adult size, Catalog # 19304020

| ACCEPTABLE | AIR & OXYGEN |
|---|---|
| **KAMEN-WILKINSON FOAM CUFF AND ENDOTRACHEAL TUBE** | **Bivona Surgical Instruments, Inc.**<br>**161 East Grand Ave.**<br>**Chicago, IL 60611**<br>**(714) 981-0802** |

**Evaluation Date:** December 1 1973

**Description:** Not available in record



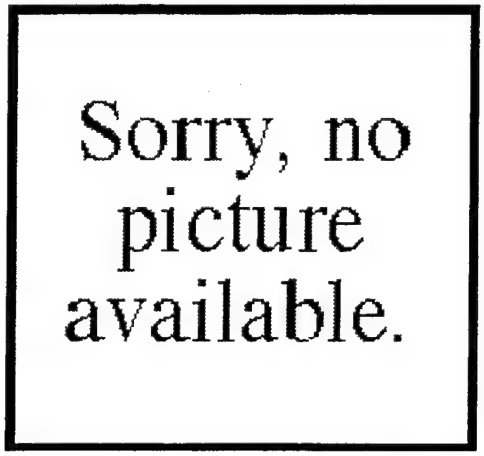
**Power Requirements:** None

**Comments:** The Kamen-Wilkinson foam cuffs were relatively unaffected by changes in ambient pressure except for the drop in pressure lasting 2-3 minutes following descent. This decline in cuff/tracheal pressure may become critical since it could lead to aspiration. Thus, selecting the proper tube size is important when using the Kamen-Wilkinson foam cuff.

| ACCEPTABLE | AIR & OXYGEN |
|---|---|
| **LANZ ENDOTRACHEAL TUBE WITH MCGINNIS CUFF** | **Extracorporeal Medical Specialties, Inc.<br>Royal & Ross<br>King of Prussia, PA 19406<br>(215) 337-2400** |

**Evaluation Date:** December 1 1973

**Description:** Not available in record




**Power Requirements:** None

**Comments:** The McGinnis high residual volume cuff with attached control balloon (Lanz endotracheal tube) allowed for fluctuations of pressure during testing with changes of altitude. This is the only cuff tested thus far that could make these changes spontaneously.

CONDITIONAL

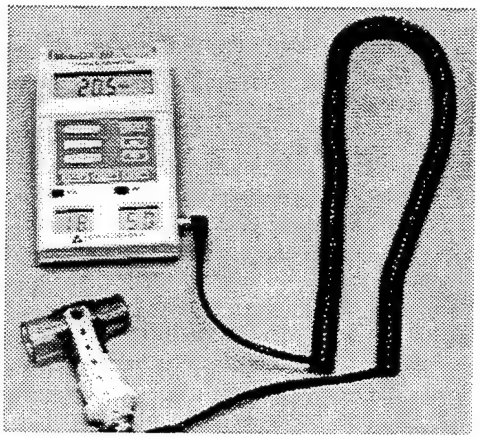
# AIR & OXYGEN

# MINIOX III OXYGEN MONITOR

**Catalyst Research**
**(A Division Of Mine Safety Appliances Company)**
**3706 Crondall Lane**
**Owing Mills, MD 21117**
**(800) 851-4500 or (301) 356-2400**

**Evaluation Date:** March 1 1989

**Description:** The MiniOX III Oxygen Monitor provides continuous oxygen monitoring in a wide variety of medical applications such as respiratory therapy, oxygen therapy, and neonatology care; including in an airborne environment.



The instrument is microprocessor controlled and monitors oxygen concentrations in the full 0-100% range. Features include high/low audible and visual alarms, easy to read digital displays, touch sensitive keypad, low battery alarms, and a sensor malfunction indicator. The microprocessor makes the MiniOX III easy to calibrate and very simple to use.

The galvanic oxygen sensor provides fast response time and maintenance free usage. The sensor should operate at least 1 year, and the battery should last approximately 2,000 hours. A tee adapter, used for calibration and inline respirator monitoring, is provided with each instrument; as is a tee adapter securing strap, mounting bracket, and carrying case.

**Power Requirements:** One 9 volt alkaline battery

**Comments:** Due to the decrease in partial pressure of oxygen at altitude, if calibrated inflight, a conversion chart must be used to ensure the same level of oxygenation as that achieved at ground level. The chart was developed by Aeromedical Research, and should be available whenever the MiniOX III is used inflight. The unit must not be stored in temperatures of 0 degrees C (32 degrees F) or below per manufacturer's requirements.

# ACCEPTABLE

## AIR & OXYGEN

## MISTOGEN ELECTRONIC NEBULIZER, MODEL EN 153A

**Mistogen Equipment Co.**
**2711 Adeline Street**
**Oakland, CA 94607**
**(415) 834-1550**

**Evaluation Date:** August 1 1973

**Description:** The Mistogen Electronic Nebulizer is a portable, 9.5 kg (21 Lb) device that utilizes radio frequency energy to excite an ultrasonic transducer crystal, that in turn produces cavitation in a column of liquid. The result is a very finely divided, cool mist that can be delivered in controllable quantities. The nebulizer components (electronics, blower, transducer, and fluid reservoir) are contained within an aluminum case. The case is 25.4 cm (10 inches) deep, 27.9 cm (11 inches) high, and 27.9 cm (11 inches) wide. A snap latch cover is removed from one side for operation. The transducer and half gallon polypropylene fluid reservoir are mounted on a movable base to facilitate preparation for operation and cleaning.

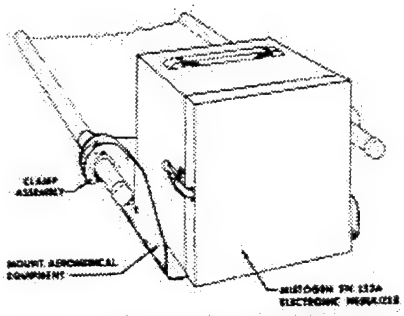


Figure 1. Mistogen EN153A Electronic Nebulizer: Attachment to MATU litter.

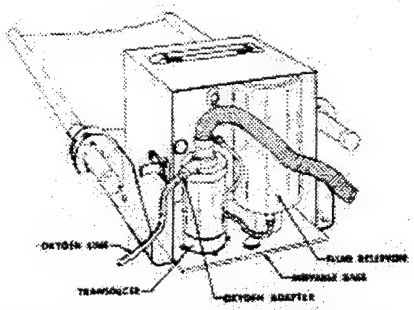


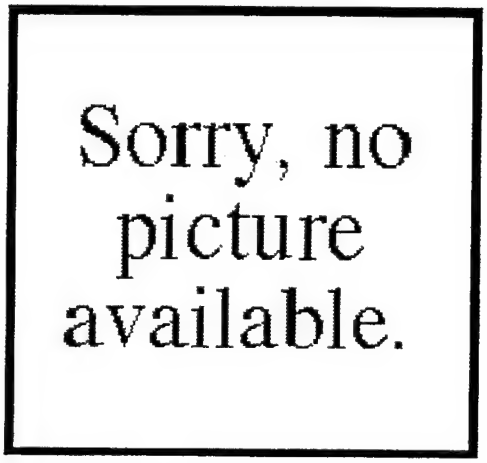
Figure 2. Mistogen EN153A Electronic Nebulizer: Arrangement for use with oxygen.

**Power Requirements:** 110 VAC 50 - 400 Hz

**Comments:** None

| ACCEPTABLE | AIR & OXYGEN |
|---|---|
| **MISTOGEN ELECTRONIC NEBULIZER, MODEL XEN 153** | **Contract** |
| **Evaluation Date:** July 1 1970 | |

**Description:** Not available in record




**Power Requirements:** Not recorded

**Comments:** In response to a Military Airlift Command request, the United States Air Force School of Aerospace Medicine procured test quantities of the Mistogen Electronic Nebulizer, Model 153. This ultrasonic device is designed to deliver controllable amounts of liquid aerosol to patients via an open mask, face tent or tracheotomy mask. The nebulizer is secured to a mount which permits easy attachment to the standard NATO litter poles.

Following operational test and evaluation (OT&E). MAC personnel recommended "standardization of the Mistogen Electronic Nebulizer, Model XEN 153." It is capable of supplying the necessary supplemental humidification required by the vast majority of patients airlifted.

The unit can be operated from an ambient air or oxygen power source.

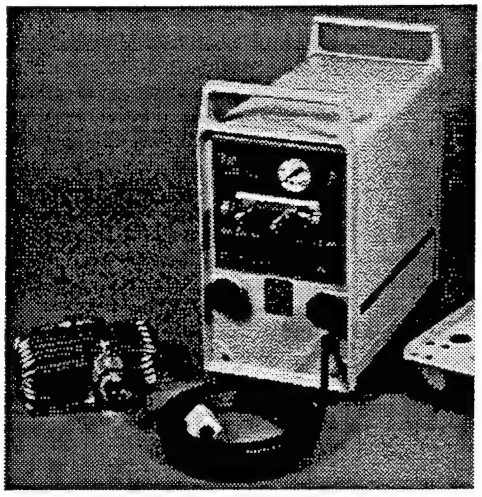
CONDITIONAL

# AIR & OXYGEN

## OHIO HIGH PERFORMANCE AIR COMPRESSOR

**Ohio Medical Products**
**P.O. Box 7550, 3030 Arco Dr.**
**Madison, WS 53707**
**(608) 221-1551**

**Evaluation Date:** August 1 1979



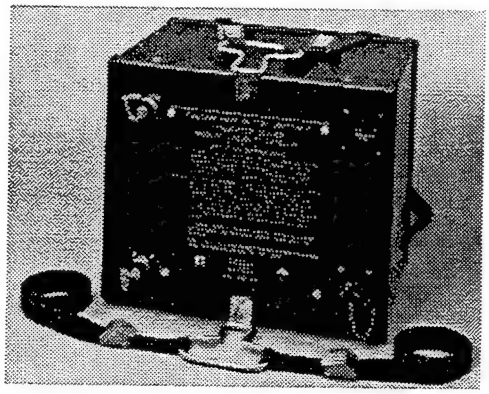
**Description:** The Ohio High Performance Air Compressor is designed to supply a constant flow of air for respiratory therapy devices which require an external source of compressed air.

**Power Requirements:** 120 VAC 60 Hz. Unit not tested on 400 Hz.

**Comments:** The Ohio High Performance Air Compressor is conditionally acceptable for use in aeromedical evacuation aircraft and Air Rescue & Recovery Service helicopters. This unit does not have a current overload protector and this could present a hazardous condition. When ordering this item from the manufacturer, request an adequate current overload protector be installed. The manufacturer has agreed to satisfy this request. The maximum flow rate at 50 psi is 28 liters per minute at sea level and 20 liters per minute at 8,000 ft. The unit was not designed for ventilator use. To use it with a ventilator, insure the air flow is adequate to operate your ventilator.

| ACCEPTABLE | AIR & OXYGEN |
|---|---|
| **PORTABLE THERAPEUTIC LOX SYSTEM 5L** | **USAF Prototype** |
| **Evaluation Date:** June 1 1973 | |

**Description:** The School of Aerospace Medicine portable therapeutic liquid oxygen system is a compact unit enclosed in a metal case. The unit contains a standard aircraft-type 5 liter LOX converter assembly, a filler, pressure buildup-and-vent valve, an oxygen regulator, a pressure gauge, and a liquid quantity gage. The gas pressure at the outlet is preset to 50 psi. The system will deliver 15 lpm providing oxygen to two patients simultaneously.



**Power Requirements:** None

**Comments:** The School of Aerospace Medicine portable therapeutic liquid oxygen systems were designed, fabricated, standardized and placed in use for worldwide aeromedical airlift on multi-mission aircraft not having an integral therapeutic oxygen system. For info on latest version. see 10-LITER PATIENT THERAPEUTIC LIQUID OXYGEN CONVERTER (PT LOX), MODEL CRU-87/U Dated January 1 1987.

CONDITIONAL

**AIR & OXYGEN**

# PRESSED STEEL TANK GAS CYLINDER, MODEL 3HT1850

**Pressed Steel Tank Co., Inc.**
**P.O. Drawere 10-J**
**Milwaukee, WI 53201**
**(414) 476-0500**

**Evaluation Date:** April 1 1990

**Description:** The Model 3HT1850 cylinders were evaluated as components of the International Biomedical Neonatal Transport System. They are lightweight and afford longer duration than standard "E" cylinders. Each cylinder has a 64 cubic foot capacity. When used to power the Bio-Med MVP-10 ventilator, depending on the flow rate and respiration rate, one each oxygen and air cylinder could last up to 9 hours.

Sorry, no picture available.

**Power Requirements:** None

**Comments:** Through coordination with the manufacturer and a review of the Department of Transportation standards, the cylinders were deemed acceptable for aeromedical use "only when properly mounted on the Neonatal Transport System (NTS)". The cylinders must be mounted so that the regulators and valves do not protrude from underneath the NTS.

CONDITIONAL

## AIR & OXYGEN

# TIMETER ARIDYNE MEDICAL AIR COMPRESSOR, MODEL 3500

**Timeter Instrument Corporation**
**Allied Health Care Products**
**2501 Oregon Pike**
**Lancaster, PA 17601**
**(800) 233-0258**

**Evaluation Date:** March 1 1980

**Description:** The Aridyne 3500 Medical Air Compressor System is designed to supply a continuous source of dry compressed air for respiratory therapy devices which require an external source of compressed air. The system will supply 45 liters per minute (LPM) at 50 psi at ground level. The moisture removal system is automatic, and the moisture removed is drained into a container in the bottom of the cabinet where it evaporates into the atmosphere. The unit is mounted on swivel castors to permit easy movement.

**Power Requirements:** 110 VAC 60 HZ, 8.5 amps (Unit not tested on 400 Hz)

**Comments:** The Timeter Aridyne 3500 Air Compressor is suitable for use in aeromedical evacuation aircraft up to 8,000 ft cabin altitude. The unit will NOT provide 50 psi pressure at altitudes above 8,000 ft. 50 psi can be maintained up to 8,000 ft, but both pressure and output flow decreases as altitude increases. Maximum flow rate from this compressor is 45 liters per minute at sea level and 41 liters per minute at 8,000 ft. If this unit is to power a ventilator, insure the air flow is adequate for that ventilator.

# ACCEPTABLE

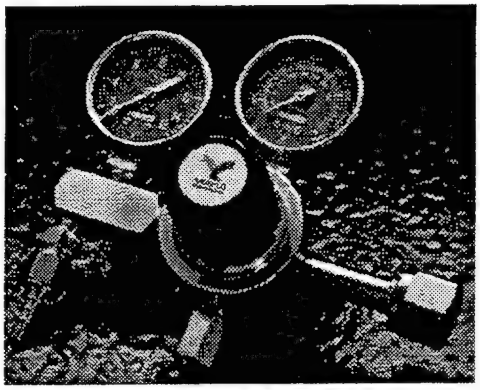
## AIR & OXYGEN

## VERIFLO OXYGEN REGULATOR, MODEL 747, P/N 1900231

**Veriflo Corporation**
**Medical Product Division**
**P.O. Box 4034**
**250 Canal Blvd.**
**Richmond, CA 94804-0034**
**(800) 962-4074 or**
**(415) 235-9590**

**Evaluation Date:** August 1 1983

**Description:** The Veriflo oxygen regulator is a heavy-duty, single-stage, pressure reducing regulator that can be mounted on large cylinders, the Therapeutic Oxygen Manifold System (TOMS) block, or the C-141B oxygen mounting provisions.



**Power Requirements:** None

**Comments:** The Veriflo regulator, model 747, for oxygen and air are acceptable for aeromedical service. The special model, P/N 19600231, is well suited for use onboard the C-141B aircraft. It can be mounted in all seven therapeutic outlets. It can be used to provide line pressures, adjustable from 0-100 psi, to drive ventilators, flowmeters, or other respiratory therapy equipment. The model 747-346-PG can be used for compressed air service. It is identical in construction but has the CGA and DISS fittings for compressed air.

# AEROMEDICAL RESEARCH STATUS GUIDE

## CARDIAC

- AMB PAK MODEL 500/AT-AF PHYSIOLOGICAL MONITOR
- AMBULATORY BLOOD PRESSURE MONITOR
- BIOMEGA BLOOD PRESSURE/PULSE MONITOR, MODEL 423B
- BIOSOURCES INTERNATIONAL AMPLIFYING STETHOSCOPES, MODELS C-2000 AND KR-700 (Cardio Sonic & Kilppert)
- BIRTCHER ELECTROCARDIOGRAPH RECORDER, MODEL 355
- BURDICK DC180M CARDIAC DEFIBRILLATOR/MONITOR SERIAL NUMBERS 020004 AND ABOVE
- BURDICK DC180M DEFIBRILLATOR/MONITOR SERIAL NUMBERS 020003 AND BELOW
- BURDICK ECG RECORDER, MODEL EK-4
- CAS MEDICAL SYSTEMS NEONATAL BLOOD PRESSURE MONITOR MODEL 901
- COROMETRICS NEONATAL CARDIAC MONITOR, MODEL 506
- DATASCOPE CARDIOTRON, MODEL 650 WITH MODEL G POWER MODULE
- DATASCOPE DUAL TRACE PHYSIOLOGIC MONITOR, MODEL 850M
- DATASCOPE M/D 2J MONITOR/DEFIBRILLATOR/SYNCHRONIZER
- DATASCOPE M/D 3A DEFIBRILLATOR SYSTEM
- DATASCOPE M/D3 MONITOR, DEFIBRILLATOR/SYNCHRONIZER, RECORDER AND SUPPORT MODULE II
- DATASCOPE PHYSIOLOGICAL MONITOR, MODEL 850
- DATASCOPE RESUSCITRON DC DEFIBRILLATOR, MODEL 680
- DINAMAP BLOOD PRESSURE MONITOR, MONITOR 845, ADULT
- FAIRFIELD DMS600 INTERNATIONAL CARDIAC MONITOR/DEFIBRILLATOR
- FILAC VITAL SIGNS MONITOR WITH BATTERY, CHARGER
- HEWLETT PACKARD 78670A DEFIBRILLATOR MONITOR
- HEWLETT-PACKARD NEONATAL MONITOR, MODEL 78260A
- LIFE PAK 3 PORTABLE BATTERY OPERATED DEFIBRILLATOR
- LIFE PAK 4 ECG MONITOR, TAPEWRITER AND DEFIBRILLATOR
- LIFE PAK 5 CARDIOSCOPE AND BATTERY PAK CHARGER
- LIFEPAK 10 CARDIAC MONITOR/DEFIBRILLATOR
- LIFEPAK 7 CARDIAC MONITOR/DEFIBRILLATOR
- LIFEPAK BATTERY SUPPORT SYSTEM (BSS)

- LIFESTAT 100 NONINVASIVE BLOOD PRESSURE MONITOR
- MDE Escort 300
- MDE ESCORT MODEL E-100, VITAL SIGNS MONITOR
- MEDASONICS ULTRASOUND STETHOSCOPE
- MEDTEK BPI 420 BLOOD PRESSURE/PULSE MONITOR
- MENNEN-GREATBATCH CARDIO/PAK 936SR MONITOR, DEFIBRILLATOR/SYNCHRONIZER, AND RECORDER
- MENNEN-GREATBATCH NEONATAL MONITOR 744 AND 700-150 CHART RECORDER
- MONOPULSE 807B DEFIBRILLATOR WITH ELECTROCARDIOSCOPI PACEMAKER, AND SYNCHRONIZER
- MOTOROLA ADVANCED PORTABLE DUPLEX CORONARY OBSERVATION RADIO (APCOR)
- MRL 450 SL-AF MONITOR, DEFIBRILLATOR/SYNCHRONIZER, RECORDER
- OMEGA BLOOD PRESSURE MONITOR, MODEL 5000-110
- PHYSIO-CONTROL ELECTROCARDIOGRAPH RECORDER
- PROPAQ VITAL SIGNS MONITOR MODEL 106
- SOMATRONIX DIGITAL BP AND PULSE MONITOR, MODEL 307
- SPACELABS VITAL SIGNS MONITOR
- SPHYGMOSTAT ELECTRONIC BLOOD PRESSURE MONITOR, MODE B-350
- SPHYGMOSTAT MODEL B-300 ELECTRONIC BLOOD PRESSURE MONITOR
- SPHYGMOSTAT MODEL P-75, PULSE MONITOR
- SPHYMETRICS INFRASONDE ELECTRONIC BLOOD PRESSURE MONITOR, MODEL M3010
- TEKTRONIX 413 PORTABLE NEONATAL MONITOR, OPTION 82, 40 SERIES RECORDER, OPTION 4
- TEKTRONIX MODEL 413A NEONATAL MONITOR
- TEKTRONIX PHYSIOLOGICAL MONITOR, TYPE 410
- ULTRASONIC MONITOR, HEMOSONDE MODEL 2300

# ACCEPTABLE

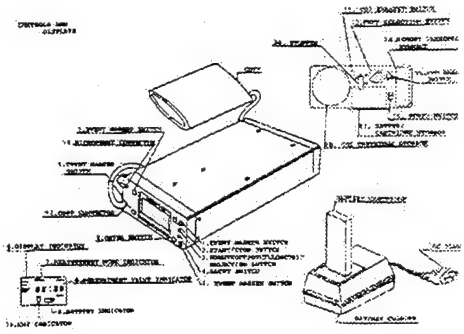
## CARDIAC

## AMB PAK MODEL 500/AT-AF PHYSIOLOGICAL MONITOR

**Medical Research Laboratories, Inc.**
**6457 W. Howard Street**
**Niles, IL 60648**
**(312) 647-0777**

**Evaluation Date:** September 1 1975

**Description:** The AMB-PAK Defibrillator/Monitor, Model 500AT-AF is completely self-contained, portable emergency lifesaving system. A DC defibrillator, ECG monitor scope, and ECG tapewriter are housed in a lightweight aluminum case easily carried by one person. It operates from internal rechargeable gel-cell batteries and AC line power. A built-in, self-regulating battery charger keeps the batteries charged while the line cord is connected to a power source. The entire unit is designed to withstand the demanding environment of aeromedical evacuation operations.



**Power Requirements:** 115 VAC 60 - 400 Hz & Internal Battery

**Comments:** The AC power mode of defibrillator operation should be used only if the defibrillator batteries are defective or fully discharged. Defibrillator use on AC power would not compromise patient/user safety, but could interfere with aircraft avionic systems. Synchronizer capability is required.

| UNACCEPTABLE | CARDIAC |
|---|---|
| **AMBULATORY BLOOD PRESSURE MONITOR** | **Colin Medical Instruments Corporation**<br>**107G Corporate Blvd.**<br>**South Plainfield, NJ**<br>**07080**<br>**(201) 754-9600** |

**Evaluation Date:** September 1 1988

**Description:** Ambulatory Blood Pressure Monitor-630 (ABPG) is a full-automatic ambulatory non-invasive blood pressure monitor measuring out-and-in patient's blood pressure for daily life of 24 hours, following instructions of doctors, medical engineers and nurses. It is compact, lightweight and ambulatory for a patient.

Sorry, no picture available.

**Power Requirements:** Battery

**Comments:** Failed EMI testing. Remainder of airworthiness testing not conducted.

# ACCEPTABLE

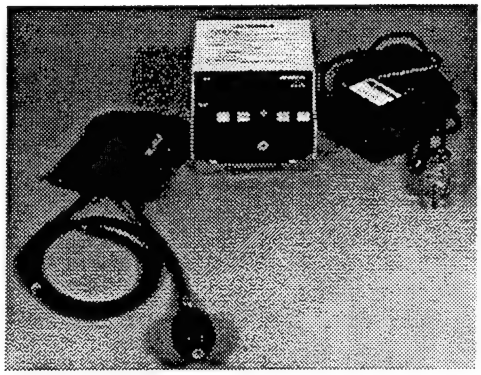
## CARDIAC

## BIOMEGA BLOOD PRESSURE/PULSE MONITOR, MODEL 423B

**Biomega Corporation**
**3622 N.E. 4 th Street**
**Gainsville, FL 32601**
**(904) 376-8751**

**Evaluation Date:** September 1 1981

**Description:** The Biomega 423B is a microprocessor based portable pressure and pulse measurement device used for the noninvasive determination of systolic and diastolic blood pressure and pulse rate. This instrument is based on the oscillometric principle and incorporates an artifact rejection scheme which can ignore most simple patient movements. Use of this principle eliminates the need for a stethoscope or microphone to listen for Korotkoff sounds. Hence, standard cuffs are used and readings are obtainable in high ambient noise environments and under adverse patient conditions.



**Power Requirements:** 115 VAC 60 Hz (400 Hz not tested) & 9.6 volt rechargeable Ni-Cad Internal battery

**Comments:** Based on the results of the tests conducted, the Biomega Blood Pressure/Pulse Monitor, Model 423B is considered acceptable for use onboard both fixed and rotary wing aircraft used for aeromedical evacuation. It should be noted that a careful technique for determining the blood pressure must be adopted as outlined under Applications in the Operations Manual. The patient's arm should not be allowed to rest on the litter or arm rest of the seat but must be supported free of these areas while taking the blood pressure.

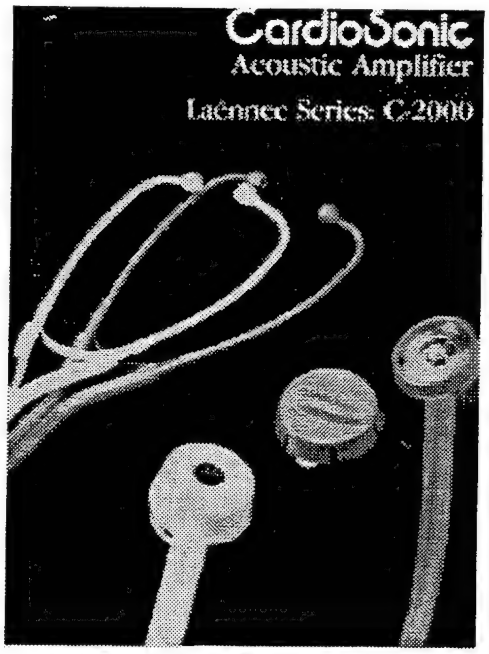
# ACCEPTABLE

## CARDIAC

## BIOSOURCES INTERNATIONAL AMPLIFYING STETHOSCOPES, MODELS C-2000 AND KR-700 (Cardio Sonic & Kilppert)

**Biosources International Inc.**
**1755 Industrial Way**
**P.O. Box 3868**
**Napa, CA 94558**
**(707) 255-6100**

**Evaluation Date:** June 1 1985




**Description:** The Model C-2000 and Model KR-700 amplifying stethoscopes function on mechanical and acoustical principles without moving parts, batteries, or wires.

**Power Requirements:** None

**Comments:** They deliver excellent audible signals of blood pressure, respiration, and heart beat, while effectively rejecting extraneous aircraft noise. The Model C-2000 utilizes a dual transmission tube while the Model KR-700 employs a single transmission tube. A transducer guard is included with the Model C-2000 to prevent accidental damage to the stethoscope head.

| ACCEPTABLE | CARDIAC |
|---|---|
| **BIRTCHER ELECTROCARDIOGRAPH RECORDER, MODEL 355** | **Unknown** |

**Evaluation Date:** December 1 1971

**Description:** Unknown

Sorry, no picture available.

**Power Requirements:** Not recorded

**Comments:** Tests performed on one Birtcher Electrocardiograph Recorder, Model 355, modified to use a three wire power cord, indicate that the unit is acceptable for use onboard aeromedical evacuation aircraft. However, the recorder cannot be used on or near an electrically susceptible patient.

# UNACCEPTABLE

## CARDIAC

## BURDICK DC180M CARDIAC DEFIBRILLATOR/MONITOR SERIAL NUMBERS 020004 AND ABOVE

**Burdick Corporation**
**Milton, WI 53563**
**(800) 868-7631**

**Evaluation Date:** May 1 1986

**Description:** The Burdick DC180M is a portable emergency cardiac defibrillator/monitor. The device features a multi-led, non-fade monitor, with digital heart rate meter. The monitor can be removed from the DC180M defibrillator unit and used separately to monitor a patient. The internal battery will operate the monitor for up to seven hours.

**Power Requirements:** 115 VAC 60-400 Hz or 12, 24 & 28 VDC or Internal battery

**Comments:** Original testing of unit on 2/1/82 found acceptable for use on 60 Hz, internal battery and 28 VDC power. In 1986 unit tested again on 115 VAC 60-400 Hz power and Failed EMI testing. This failure caused the unit to no longer considered acceptable for use on board United States Air Force/Military Airlift Command aeromedical aircraft.

CONDITIONAL

CARDIAC

# BURDICK DC180M DEFIBRILLATOR/MONITOR, WITH SERIAL NUMBERS 020003 AND BELOW

**Burdick Corporation**
**Milton, WI 53563**
**(800) 868-7631**

**Evaluation Date:** February 1 1982

**Description:** The Burdick is a completely portable emergency system, well-suited for vehicle or aeromedical patient transport. The battery pack is capable of supplying approximately 70 maximum energy discharges before recharging is necessary. The defibrillator has synchronization capabilities. All controls, ECG outlet, fuses, and the ECG writer are located on the front of the unit. The DC180M utilizes a CS-615 monitor featuring a multi-lead, non-fade freeze frame monitor, with digital heart rate meter and a battery pack. The monitor can be removed from the DC180M defibrillator unit and used separately to monitor a patient. It is powered by 12, 24, or 28 VDC and incorporates a rechargeable battery pack that operates the unit for approximately 7 hours.

Sorry, no picture available.

**Power Requirements:** 12, 24, 28 VDC or 115 - 230 VAC 60 Hz (400 Hz not tested) or Internal battery

**Comments:** Only Burdick DC 180M Defibrillator/Monitors with serial numbers 020003 and below are approved for inflight use. For aeromedical evacuation use AC input line filters be relocated next to the front panel entrance of the power cable, all flat cable connectors be provided with some type of fastening device. Users should be aware of devices susceptibility to AC power disturbances and the difficulty in securing the defibrillator to a litter.

CONDITIONAL

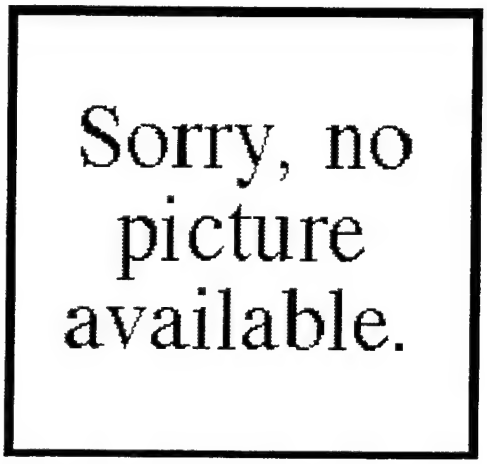
**CARDIAC**

# BURDICK ECG RECORDER, MODEL EK-4

**Burdick Corporation**
**Milton, WI 53563**
**(800) 868-7631**

**Evaluation Date:** August 1 1973

**Description:** Not available in record




**Power Requirements:** Not recorded

**Comments:** The Burdick ECG Recorder, Model EK-4, is acceptable for use onboard aeromedical evacuation aircraft. It exceeds the 10 microampere maximum specified in Air Force Regulation 160-3, and should not be used on or near an electrically susceptible patient.

# ACCEPTABLE

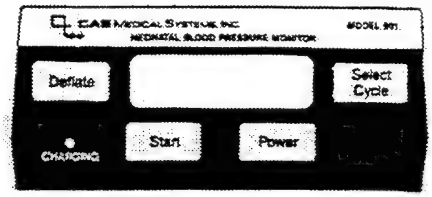
## CARDIAC

## CAS MEDICAL SYSTEMS NEONATAL BLOOD PRESSURE MONITOR MODEL 901

**CAS Medical System Inc.**
**Business Park Dr.**
**Branford, CT 06405**
**(800) 227-4414**

**Evaluation Date:** April 1 1990

**Description:** It non-invasively uses the oscillometric technique to measure the mean arterial pressure, systolic and diastolic blood pressure, pulse rate of the neonate.




**Power Requirements:** 120 VAC 60 Hz, 0.13 amp, operated with Model 900C adapter/charger or Internal battery

**Comments:** The Model 901 was evaluated as a component of the International Biomedical Neonatal Transport System. The Model 901 may be used apart from or as a component of the International Biomedical Neonatal Transport System.

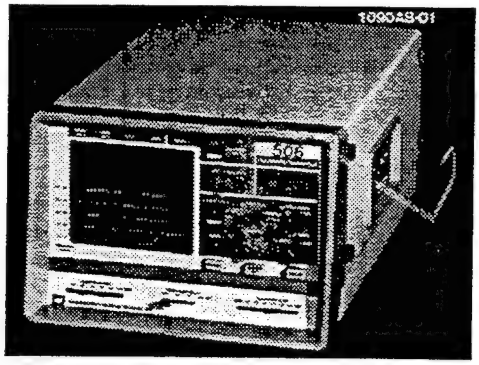
CONDITIONAL

## CARDIAC

# COROMETRICS NEONATAL CARDIAC MONITOR, MODEL 506

**Corometrics Medical Systems**
**61 Bames Park Rd N.**
**Wallingford, CT 06492**
**(800) 243-3952**

**Evaluation Date:** April 1 1990




**Description:** Features include cardiac, blood pressure, respiration, and temperature monitoring.

**Power Requirements:** 120 VAC / 60 Hz, 0.17 amp, internal battery

**Comments:** The Model 506 may be used independently, or as a component of the Neonatal Transport System. During rapid decompression testing from 10,000 to 40,000 ft, the cathode-ray tube was damaged, making part of the display screen unreadable. This malfunction was not considered a failure since it presented no danger to the patient or personnel. Unit Must be modified to conform to MIL-STD-461C, Category A1e.

# UNACCEPTABLE

**CARDIAC**

## DATASCOPE CARDIOTRON, MODEL 650, WITH MODEL G POWER MODULE

**Datascope Corporation**
**520 Victor Street**
**Saddle Brook, NJ 07662**
**(201) 845-7650**

**Evaluation Date:** December 20 1970

**Description:** Not available in record

Sorry, no picture available.

**Power Requirements:** 90 - 117 VAC 50 - 60 Hz or Battery

**Comments:** The Datascope Cardiotron, Model 650, with the Model G Power Module, is unacceptable for use on United States Air Force Aeromedical Aircraft. The unit possessed satisfactory operational characteristics, did not exceed electromagnetic interference limits, and operated satisfactory under environmental conditions of: 1) 8,000 feet equivalent altitude; 2) high temperature of 120 degrees F; 3) low temperature of 40 degrees F; 4) low humidity of 30 - 35%; and 5) high humidity of 90 - 98%. However, due to problems with construction, the inability to withstand operations under prolonged vibration, incompatibility with electrical power systems on multi-purpose aircraft configured for aeromedical airlift and the improper operation of the battery mode function are grounds for judging this unit is unacceptable for use in aeromedical operations.

# ACCEPTABLE

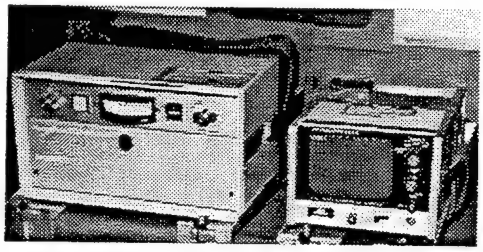
## CARDIAC

## DATASCOPE DUAL TRACE PHYSIOLOGIC MONITOR, MODEL 850M

**Datascope Corporation**
**580 Winters Ave**
**Paramus, NJ 07652**
**(201) 265-8800**

**Evaluation Date:** July 1 1973

**Description:** The Datascope Dual Trace Physiological Monitor, Model 850M, is a dual trace, battery operated instrument permitting monitoring ECG, FHT or EEG on the upper trace, and on the lower trace monitor and the patient's peripheral pulse using the optical plethysmograph sensor supplied as a standard accessory. The unit has solid-state integrated circuits, extremely rapid recovery of ECG signal after overload by a defibrillation or cautery impulse, synchronization of the ECG trace beat-by-beat to provide direct readings of heart rate, heart rate beeper and arrest alarm, and a self contained battery pack



**Power Requirements:** 115 VAC 50-400Hz or Internal battery

**Comments:** When operated from the internal battery supply, it may be used on an electrically susceptible patient. However, if the unit's battery is being charged, or if it is interconnected to a defibrillator, it cannot be used on or near an electrically susceptible patient.

# UNACCEPTABLE

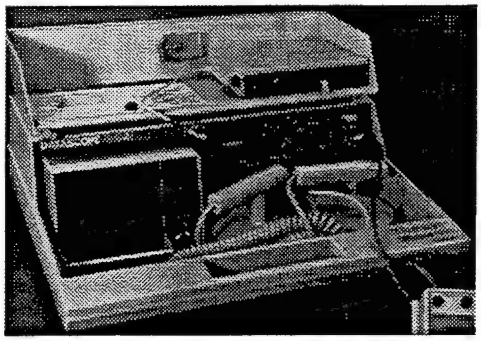
## CARDIAC

# DATASCOPE M/D 2J MONITOR/DEFIBRILLATOR/ SYNCHRONIZER DATABANK 770 RECORDER, AND STANDARD BATTERY CHARGER

**Datascope Corporation**
**580 Winters Ave**
**Paramus, NJ 07652**
**(201) 265-8800**

**Evaluation Date:** May 1 1977

**Description:** The Datascope M/D 2J Defibrillator/Synchronizer with modular monitor acts as a compact, portable, battery operated unit. A capability is provided to have two portable units should the need arise since the monitor can be removed from the main case. The Databank 770 recorder, which can record both the electrocardiogram and voice for one hour per cassette (30 minutes each side), can be attached to the main case or to the top of the monitor. The standard battery charger operates from a 110 VAC 60 Hz power source and cannot be used to charge the batteries while any portion of the main unit is in use. It connects to the right face of the defibrillator/synchronizer case. When the monitor batteries are to be charged, the monitor must be connected into its holder in the main case. The monitor battery pack can operate the monitor for four hours. The defibrillator battery pack provides a minimum of 50 discharges at 460 joules delivered energy.



**Power Requirements:** 110 VAC 60 Hz or Battery

**Comments:** Unit failed vibration and decompression tests. The scope was adversely affected by altitude. Overall the Datascope M/D 2J is considered unreliable under conditions of aeromedical evacuation.

# UNACCEPTABLE

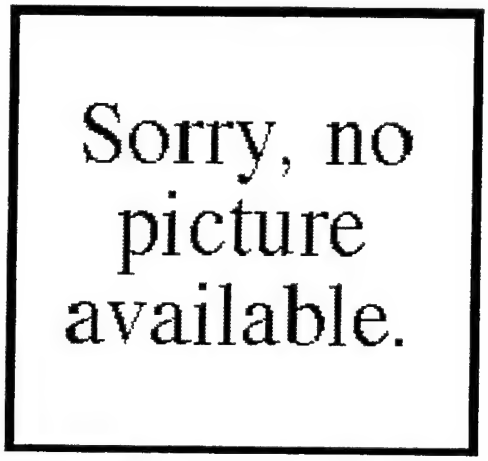
**CARDIAC**

## DATASCOPE M/D 3A DEFIBRILLATOR SYSTEM

**Datascope Corporation**
**580 Winters Ave**
**Paramus, NJ 07652**
**(201) 265-8800**

**Evaluation Date:** February 1 1984

**Description:** The Datascope M/D 3A Defibrillator System is an integral monitor/defibrillator/recorder. The M/D 3A provides a non-fade display of the patient ECG signal on a 5 inch diagonal screen. The ECG pattern can be acquired by either the defibrillator paddles or through the use of a patient cable and skin electrodes. The heart rate is displayed by a digital readout. The M/D 3A incorporates high and low heart rate limits which activate an alarm when violated. The monitor may be operated approximately 2.25 hours with fully charged batteries. A low battery indicator alerts the user that approximately 0.5 hours of battery operating time remains. The defibrillator provides eleven selectable energy steps ranging from 5 to 400 Joules. As the M/D 3A is charging toward the selected energy level, the digital energy meter will indicate the incremental energy levels as they are reached. Upon reaching the selected energy level, a safety ready tone is sounded and a safety ready light becomes illuminated. At this time the amount of energy which the M/D 3A will deliver is displayed on the digital energy meter. The defibrillator is powered from a separate battery supply so that long-term monitoring will never deplete the charge on the defibrillator battery. A new fully-charged battery will provide approximately thirty 400 joules discharges. The recorder in the M/D 3A operates in conjunction with the monitor. The recorder provides a permanent record of the patient ECG on 40 mm paper, at 25 mm/sec. The size of the recording is automatically controlled by the size display on the monitor screen. With new, fully-charged batteries, recording for up to forty minutes is possible.




**Power Requirements:** 115 VAC 60 - 400 Hz or Battery

**Comments:** Failed EMI testing. Unit was found to have excessive EMI.

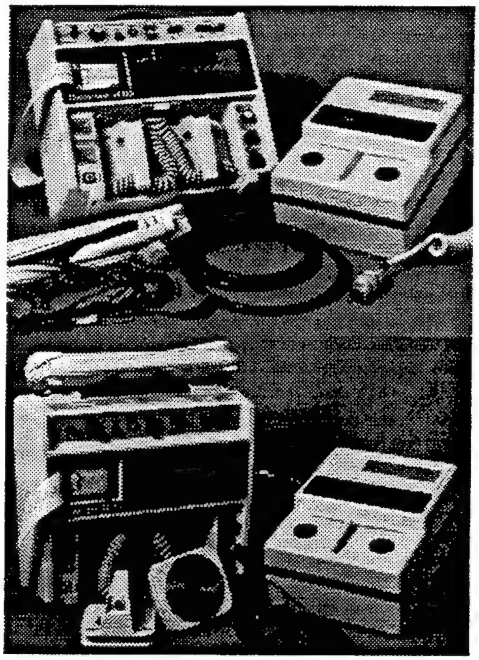
CONDITIONAL

## CARDIAC

# DATASCOPE M/D3 MONITOR/DEFIBRILLATOR/ SYNCHRONIZER, RECORDER AND SUPPORT MODULE II

**Datascope Corporation**
**580 Winters Ave**
**Paramus, NJ 07652**
**(201) 265-8800**

**Evaluation Date:** January 1 1980



**Description:** The Datascope M/D3 is an integral monitor, defibrillator/ synchronizer and recorder. It can be fully battery operated or, with support module II, can be AC line operated. The M/D3 features a full-sized, nonfade, 12.7 cm (5-inch) diagonal monitor screen. The ECG pattern can be acquired through the look-thru defibrillator paddles or by a patient cable. The heart rate is displayed on a chart recorder. The defibrillator can provide up to 500 joules of delivered energy.

**Power Requirements:** 115 VAC 60 - 400 Hz or Battery

**Comments:** When ordering specify Air Force model for support module II. The optional lithium battery pack is not recommended for aircraft use.

Silver interior shielding must be present for EMI shielding. All leakage currents were within the limits of Air Force Regulation 160-3 for Class A devices. The M/D3 may be used on electrically susceptible patients. Based on the results of the tests conducted, the Datascope M/D3 model with EMI shielding is considered acceptable for use in aircraft used for aeromedical evacuation.

| ACCEPTABLE | CARDIAC |
|---|---|
| **DATASCOPE PHYSIOLOGICAL MONITOR, MODEL 850** | **Datascope Corporation**<br>**580 Winters Ave**<br>**Paramus, NJ 07652**<br>**(201) 265-8800** |

**Evaluation Date:** July 1 1972

**Description:** Not available in record

Sorry, no picture available.

**Power Requirements:** Not recorded

**Comments:** The Datascope Model 850, Dual Trace Physiological Monitor, modified to secure printed circuit boards and transformers and to lengthen wires from input selector switch to input of the amplifier printed circuit board, is acceptable for use onboard aeromedical evacuation aircraft. The unit cannot monitor the patient during defibrillation.

CONDITIONAL

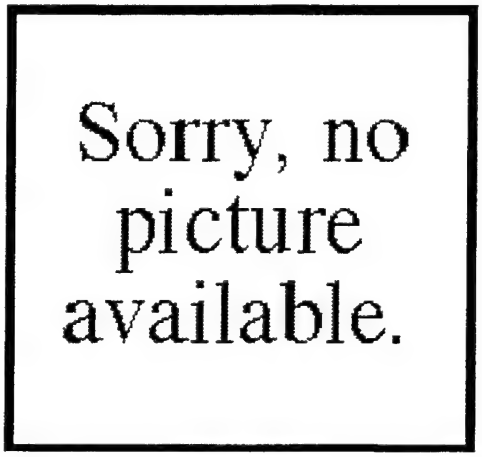
**CARDIAC**

# DATASCOPE RESUSCITRON DC DEFIBRILLATOR, MODEL 680

**Datascope Corporation**
**580 Winters Ave**
**Paramus, NJ 07652**
**(201) 265-8800**

**Evaluation Date:** July 1 1972

**Description:** The Datascope Resuscitron, Model 680, DC defibrillator, is a portable, rechargeable battery-powered instrument which provides DC energy pulse for the treatment of ventricular fibrillation and for conversion of cardiac arrhythmias. The Resuscitron stores up to 400 joules (watt-seconds) of energy in a 16-microfarad oil-filled capacitor. The capacitor is charged in a matter of seconds by automatic control which stops the charging process when the preselected energy level is reached. An energy-level meter, calibrated in joules, is provided to verify the energy available for discharge. Stored energy is delivered to the patient as a smooth, monophasic pulse, approximately 4 milliseconds wide at the base. As a safety precaution for the operator, the pulse discharge can only be initiated by the combined action of two push buttons, one in each of the paddles.



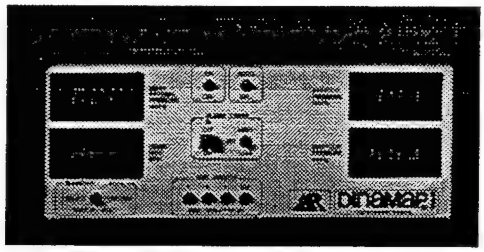

**Power Requirements:** Ni-Cad batteries charged with 15V built-in battery charger. Battery charger operates on 115 VAC 50-400 Hz

**Comments:** Datascope Resuscitron DC Defibrillators with serial numbers 2049 and higher are acceptable for use on United States Air Force aeromedical aircraft. Units below this number are considered electrically hazardous to patients when the unit is plugged into an AC outlet. When defibrillating it is recommended the unit not be plugged into AC line power.

| UNACCEPTABLE | CARDIAC |
|---|---|
| **DINAMAP<br>BLOOD PRESSURE MONITOR<br>845 - ADULT AND<br>847 - INFANT** | **Ramtec Medical Inc.<br>830 FM 1960 West Suite 17<br>Houston, TX 77090<br>(713) 440-7300** |

**Evaluation Date:** September 27 1978

**Description:** The oscillometric technique objectively determines systolic and diastolic pressures correlating closely with standard auscultatory and invasive measurements. Measures mean arterial pressure, systolic and diastolic pressure, and heart rate by the oscillometric method. Mean arterial pressure is determined by the microprocessor to be the minimum cuff pressure at which maximum pressure pulsations are found. Adaptive programs reject most artifact and automatically compensate for a wide range of patient variables.




**Power Requirements:** 100 VAC, 120 VAC, 240 VAC, 50-60 Hz

**Comments:** Failed EMI testing.

# UNACCEPTABLE

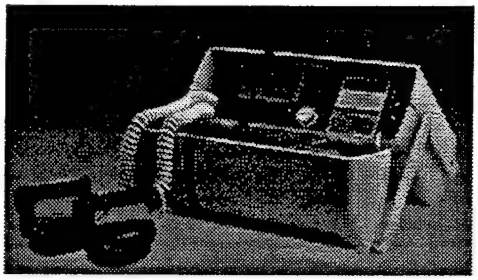
**CARDIAC**

## FAIRFIELD DMS600 INTERNATIONAL CARDIAC MONITOR/DEFIBRILLATOR

**Fairfield Medical Products**
**837 E. Main St.**
**Stanford, CT 06902**

**Evaluation Date:** March 29 1982

**Description:** See manufacturer brochure.



**Power Requirements:** Rechargeable batteries

**Comments:** Failed EMI testing. No further testing was done.

CONDITIONAL

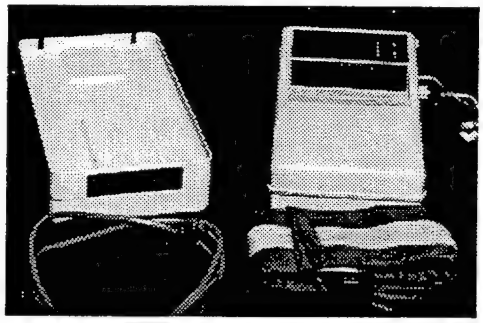
## CARDIAC

# FILAC VITAL SIGNS MONITOR WITH BATTERY, CHARGER

**Filac Corporation**
**1259 Reamwood Ave.**
**Sunnyvale, CA 94086**

**Evaluation Date:** September 23 1975

**Description:** The Vital Signs Monitor is a portable instrument that digitally displays, by means of Light Emitting Diodes (LEDS), the measurement of temperature, pulse rate, and blood pressure. The basic instrument is powered by nickel-cadmium batteries that may be recharged by inductive coupling when the basic unit is placed on top of its AC charging unit. Blood pressure and pulse are obtained indirectly, subsequent to properly placing a cuff on an arm or other limb. Temperature is taken by placing a probe sublingually in the patient's mouth.



**Power Requirements:** 115 VAC 60 Hz or Internal Battery & Charger

**Comments:** Failed EMI testing on line power. Acceptable for use "ONLY" on internal batteries.

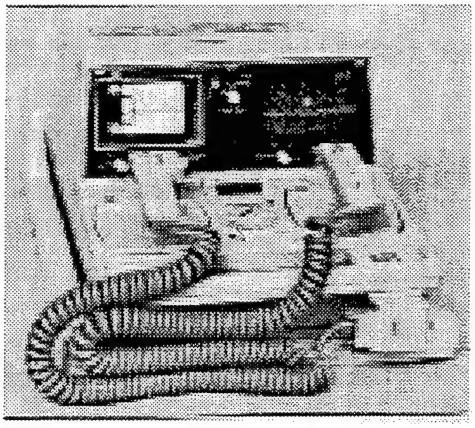
# UNACCEPTABLE

## CARDIAC

## HEWLETT PACKARD 78670A DEFIBRILLATOR MONITOR

**Hewlett Packard Company**
**Medical Products Group**
**McMinnville Division**
**1700 South Baker St.**
**McMinnville, OR 97128**
**(503) 472-5101**

**Evaluation Date:** March 1 1986



**Description:** The Hewlett Packard 78670A is a portable monitor/defibrillator/ recorder designed for hospital applications. It provides a non-fade, fixed trace display of the patient ECG signal on a 4.5 cm x 9 cm screen for 3.75 seconds. The ECG pattern can be acquired by either the defibrillator paddles or through the use of a 3-lead patient cable with LEADS or PADDLES indicator lights to show selected source. If any patient lead becomes disconnected, a lead fault INOP indicator flashes. The heart rate is displayed by a digital readout from 20 to 240 BPM. The 78670A has preset alarms at 30 and 150 BPM, with automatic recording and documentation when exceeded. With fully charged batteries, the 78670A can deliver 2.5 hours of monitoring or 1.5 hours combined monitoring and recording. A BATTERY indicator light is on when the battery is charging and flashes when the battery is low. The defibrillator provides eleven selectable energy steps ranging from 5 Joules to 360 Joules. Defibrillator charge time to 360 Joules is less than 10 seconds. A SYNC indicator flashes off with each detected R-wave. A marker pulse on the monitor indicates defibrillator discharge point. Discharge occurs within 30 milliseconds of marker pulse. The unit incorporates a unique paddle contact indicator on the sternum paddle. A 3-color LED bar graph array helps the operator achieve best paddle contact to optimize current delivered to the patient. When the paddles are applied to the patient, the LED changes from RED to YELLOW to GREEN as the patient impedance decreases, indicating proper paddle pressure and sufficient electrolyte applied. With fully charged batteries, the 78670A can deliver 50 full energy discharges.

**Power Requirements:** 100 - 130 VAC 50 - 400 Hz or Rechargeable Ni-Cad battery

**Comments:** Failed EMI testing.

CONDITIONAL

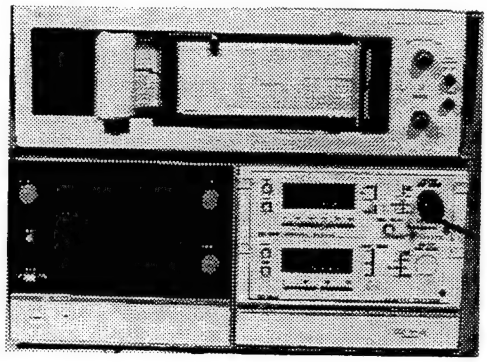
## CARDIAC

# HEWLETT-PACKARD NEONATAL MONITOR, MODEL 78260A

**Hewlett-Packard Medical Supply Division**
**175 Wyman Street**
**Waltham, MA 02154**
**(800) 225-0230 or (617) 890-6300**

**Evaluation Date:** August 1 1978

**Description:** The Hewlett-Packard Neonatal Monitor, Model 78260A, provides the capability to monitor heart rate and respiratory rate simultaneously and provides an oscilloscope display of these parameters. It provides alarm systems for both parameters.



**Power Requirements:** 115 VAC 50 - 60 Hz

**Comments:** The heart rate module must be modified to reduce radiated emissions.

CONDITIONAL

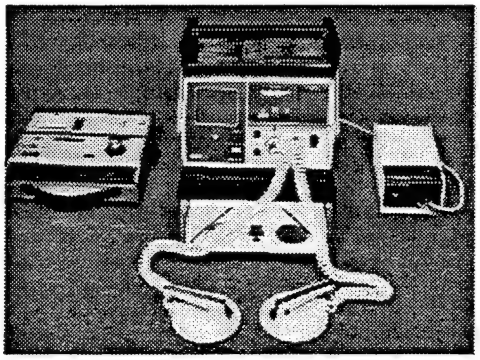
CARDIAC

# LIFE PAK 3 PORTABLE BATTERY OPERATED DEFIBRILLATOR

**Physio-Control Corp.**
**11811 Willows Rd**
**Redmond, WA 98052**
**(800) 426-8047**

**Evaluation Date:** December 1 1974

**Description:** The Lifepak 3 is a portable, battery operated instrument for monitoring the ECG signal from a patient. A solid-state memory and a freeze circuit are combined to offer a choice between real time display or a QRS complex held in time for close inspection or measurement. The defibrillator is a controlled monophasic defibrillator pulse to the patients heart. Rapid assessment of the patient's condition and fast delivery of the DC defibrillating pulse are both accomplished through the same pair of quick-look paddles.



**Power Requirements:** 115 VAC 60-400Hz (Available through charger only) internal battery

**Comments:** The basic Life Pak 3 unit (no telemetry modulator) may be used onboard aeromedical airlift aircraft only if, when purchased, the RFI option (RFI Shielding) is obtained with the basic unit, and the unit is operated from its internal battery pack. Under these conditions, the Life Pak 3 unit complies with MIL-STD-461A emission limits. When the Life Pak 3 unit is operating from its internal battery pack, leakage current is not present. However, when the Life Pak 3 unit is used with the Charge Pak and operated from 115 VAC power, leakage current exceeds the 10 microamperes specified in paragraph 4.8.1 of the Association for the Advancement of Medical Instrumentation (AAMI) Safety Standard for electromedical apparatus, if the third wire (ground) of the Charge Pak AC cable is broken or disconnected. Therefore, the Life Pak 3 unit, when operating from 115 VAC, should not be used on or near an electrically susceptible patient (a patient with probes, catheters, or other conductive paths from outside the body into the thorax) unless, prior to use, the third wire (ground) of the Charge Pak AC cable and AC outlet power source are checked and found to have a low resistance continuity.

# ACCEPTABLE

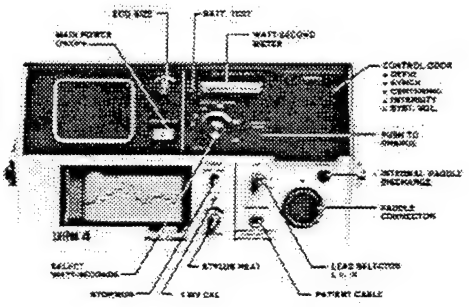
## CARDIAC

## LIFE PAK 4 ECG MONITOR, TAPEWRITER AND DEFIBRILLATOR

**Physio-Control Corp.**
**11811 Willows Rd.**
**REDMOND, WA 98052**
**(800) 426-8047**

**Evaluation Date:** March 1 1975

**Description:** The Lifepak 4 consists of an ECG monitor, defibrillator, tape-writer and paddles built into a plastic carrying case. A separate Charge-Pak unit (battery Charger) is used when the Lifepak 4 operates from 115 VAC 60-400Hz power.



**Power Requirements:** 115 VAC 60-400 Hz or Internal battery

**Comments:** The Lifepak 4 and Chargepak units are acceptable for use onboard aeromedical airlift aircraft. The units passed all environmental tests including vibration, rapid decompression, and electromagnetic compatibility tests. In accordance with para 4.2.2, Association for the Advancement of Medical Instrumentation (AAMI), Safe Currents Limits Standard (April 1974), the Life Pak 4 and Charge Pak unit are classified as equipment having "nonisolated patient connections." The Life Pak 4 unit does not exceed the leakage current limits specified by Table 4.3.1 of the AAMI Standard, when the unit is operating from it self-contained battery pack. The unit does exceed the leakage current limits when operating from 115 VAC 400 Hz, using the Charge Pak unit, and with the third wire of the Charge Pak unit open. However, the unit does not exceed the leakage current limits when operating from 115 VAC 400 Hz, using the Charge Pak unit, and with the third wire of the unit closed. The Life Pak 4 tapewriter uses thermo writing (heat sensitive) chart paper, Physio-Control No. 09-100-60, that is 48 mm wide having a 45 mm grid.

# ACCEPTABLE

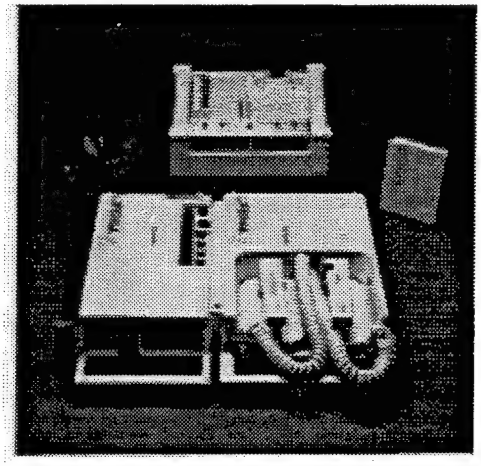
## CARDIAC

## LIFE PAK 5 CARDIOSCOPE AND BATTERY PAK CHARGER

**Physio-Control Corporation**
**11811 Willows Rd.**
**Redmond, WA 98052**
**(800) 426-8047**

**Evaluation Date:** December 1 1977 & May 1 1979

**Description:** The Life Pak 5 consists of two modular units (Cardioscope/Recorder and DC defibrillator). The modules may be used individually or in combination. The defibrillator module has synchronization capabilities. In order for the synchronization function to be operable the monitor and defibrillator must be connected. All controls, ECG outlet, and low battery light are located on the right upper surface of the cardioscope/recorder module. The defibrillator controls and power switch are located on the paddles of the DC defibrillator module. The SYNC power switch/light is located on the left lower front of the defibrillator module. Both modules are powered by a replaceable, rechargeable 12 VDC Ni-Cad battery/pak. The cardioscope, with intermittent use of the recorder, will operate approximately 2 1/2 to 3 hours from one fully charged battery pak. The Battery/Pak charger is a separate unit that is powered from a 115 VAC 50-60 Hz or 12 VDC power source. A depleted Battery/Pak can be charged to full charge in 4 hours. The charger will charge two battery/paks simultaneously. All indicator lights are located on the upper surface of the charger. A metal test load plate for testing the defibrillator charge is located on each side of the charger.

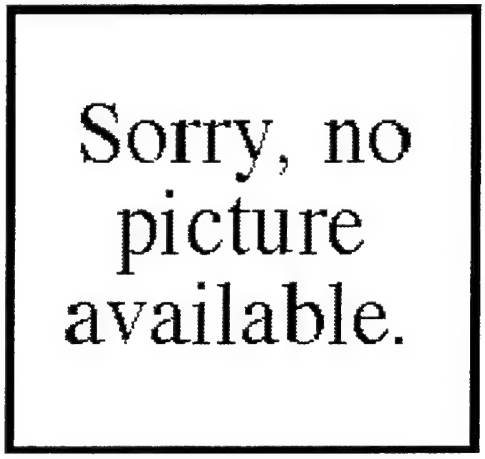


**Power Requirements:** 110 VAC 50 - 400 Hz (Battery Charger), 0.16 amp. Internal Battery (Life Pak 5)

**Comments:** Based on results of tests conducted on the Life Pak 5 Cardioscope, Recorder, and Defibrillator/Synchronizer modules can be considered acceptable for use on board aeromedical evacuation aircraft and Air Rescue & Recovery Service helicopters. Life Pak 5 batteries may be charged by the Physio-Control Battery Support System (BSS), which was evaluated and approved in 1991.

| UNACCEPTABLE | CARDIAC |
|---|---|
| **LIFEPAK 7 CARDIAC MONITOR/ DEFIBRILLATOR** | **Physio-Control Corporation 11811 Willows Rd. Redmond, WA 98052 (800) 426-8047** |
| **Evaluation Date:** April 10 1984 | |

**Description:** Not available in record.




**Power Requirements:** 115 VAC 60 - 400 Hz

**Comments:** Failed EMI testing. Testing halted per manufacturer's request.

CONDITIONAL

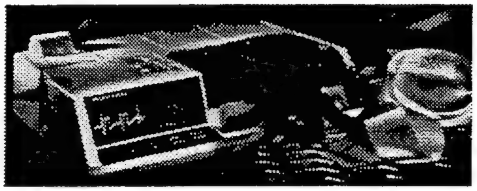
**CARDIAC**

# LIFEPAK 10 CARDIAC MONITOR/DEFIBRILLATOR

**Physio-Control Corporation**
**11811 Willows Rd.**
**Redmond, WA 98052**
**(800) 426-8047 or (206) 867-4000**

**Evaluation Date:** January 1 1991

**Description:** The Lifepak 10 is a portable monitor and defibrillator. It is battery powered and contains a cathode ray cardioscope, which displays real time electrocardiographs, and two defibrillator paddles which may discharge any of nine selectable energy levels. The Lifepak 10 holds three Ni-Cad batteries which are alternately used to power the device. Total operating time for the three batteries is approximately two hours. The Lifepak Battery Support System, may be used to charge 3 extra Ni-Cad Batteries



**Power Requirements:** Ni-Cad Batteries

**Comments:** The Lifepak 10 may be used inflight only on battery power and if electromagnetic interference (EMI) modifications have been made and identified by the number "43" at the end of the part number.

CONDITIONAL

**CARDIAC**

# LIFEPAK BATTERY SUPPORT SYSTEM (BSS)

**Physio Control**
**11811 Willows Rd. Northeast**
**P.O. Box 97006**
**Redmond, WA 98073-9706**
**(800) 426-8047 or (206) 867-4000**

**Evaluation Date:** January 1 1991

**Description:** The BSS is used to charge Ni-Cad batteries used in Lifepak 5 and Lifepak 10 cardiac monitor/defibrillators.

Sorry, no picture available.

**Power Requirements:** 120 VAC 60 - 400 Hz, 1.6 amps

**Comments:** It must be modified to meet MIL-STD-461C for electromagnetic compatibility, and must be labeled as such. When initially plugged in with 3 depleted batteries in place, there will be a short (<1 sec) current draw of approximately 3.2 amps.

# UNACCEPTABLE

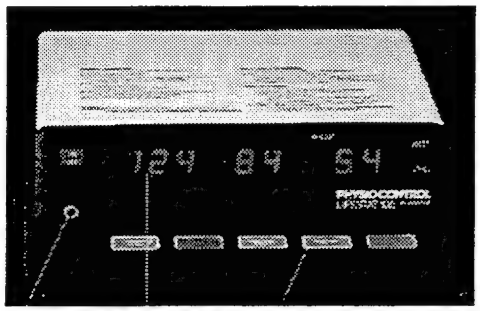
## CARDIAC

## LIFESTAT 100 NONINVASIVE BLOOD PRESSURE MONITOR

**Physio Control**
**11811 Willows Rd. Northeast**
**P.O. Box 97006**
**Redmond, WA 98073-9706**
**(800) 426-8047 or (206) 867-4000**

**Evaluation Date:** November 28 1986

**Description:** The Lifestat 100 is microprocessor-based, portable, blood pressure and pulse measurement device used for noninvasive determination of systolic/diastolic blood pressure, pulse rate, and mean arterial pressure. Measurements are based on an oscillometric technique which uses arterial pulsations acting against the inflated cuff for pulse and blood pressure determination. Cuff inflation pressures can be tailored to limb size by selecting high or low inflation pressures. Automatic blood pressure measurements can be programmed for 1, 2, 3, 5, 10, 15, and 30 minute intervals.




**Power Requirements:** 115 VAC 60Hz or Internal battery

**Comments:** Failed EMI test.

# UNACCEPTABLE

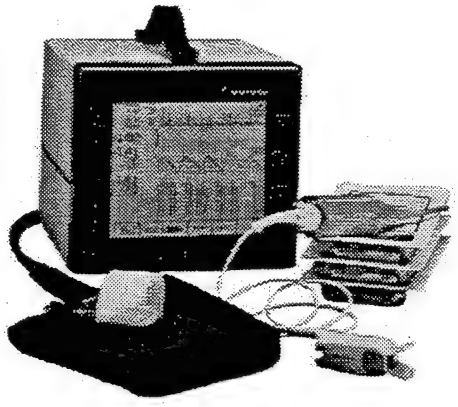
## CARDIAC

## MDE Escort 300

**Medical Data Electronics (MDE)**
**9201 Cranford Ave.**
**Arleta, CA 91331-9987**
**(800) 237-5243**

**Evaluation Date:** August 1 1990

**Description:** Compact, lightweight flat panel design, modular battery design for long-term uninterrupted monitoring. Over 200 configurations including ECG, Resp, IBP, NIBP, SaO2, and Temp. Alarm and manual recordings.



**Power Requirements:** 110 VAC 60 Hz

**Comments:** Failed EMI and vibration testing.

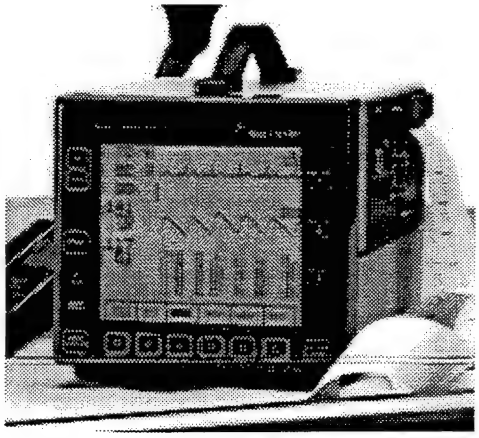
# UNACCEPTABLE

## CARDIAC

## MDE ESCORT MODEL E-100, VITAL SIGNS MONITOR

**Medical Data Electronics**
**9201 Cranford Ave.**
**Arleta, CA 91331-9987**
**(800) 237-5243**

**Evaluation Date:** December 1 1990



**Description:** Not available in record

**Power Requirements:** 115 VAC 60 Hz or Internal Battery

**Comments:** Unit returned to manufacturer in Jan 1991 with no further testing accomplished.

# ACCEPTABLE

## CARDIAC

## MEDASONICS ULTRASOUND STETHOSCOPE

**MedaSonics**
**340 Pioneer Way**
**P.O. Box M**
**Mountain View, CA 94042**
**(800) 227-8076 or (415) 965-3333**

**Evaluation Date:** May 1 1981

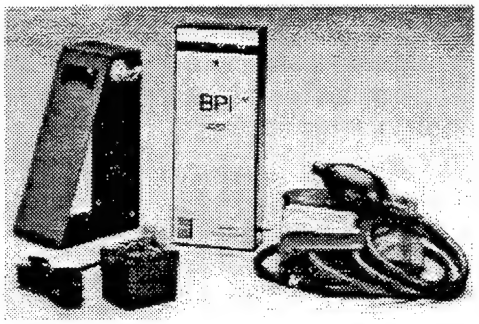
**Description:** The MedaSonics Ultrasound Stethoscope is a Doppler blood flow detector, designed specifically for detecting blood flow in the arterial and deep venous system of the extremities.

**Power Requirements:** 9 Volt alkaline battery

**Comments:** A diastolic BP reading cannot be obtained with this unit. The previous catalog number was BF4A. The new number is BF4B. Electronically and functionally it is the same unit, but with a stronger, sturdier case.

| ACCEPTABLE | CARDIAC |
|---|---|
| **MEDTEK BPI 420 BLOOD PRESSURE/PULSE MONITOR** | **Medtek Corporation**<br>**745 Alexander Rd.**<br>**Princeton, NJ 08540**<br>**(800) 527-0226 or (609) 452-9393** |
| **Evaluation Date:** February 1 1982 | |

**Description:** The Medtek BPI 420 Blood Pressure/Pulse Monitor is a small portable unit that can be readily hand held or permanently mounted to a desk top or wall. It measures systolic and diastolic arterial pressures as well as pulse rate, using an oscillometric technique in conjunction with a microprocessor. The BPI 420 uses a standard adult-size cuff system with Velcro fasteners, inflation bladder, and bulb. Cuff deflation is automatically controlled at a deflation rate of 2.3 min. Hz/sec. This unit automatically calibrates itself to the ambient barometric pressure from 1200 ft (366 m) below sea level to 30,000 ft (9,146 m) above sea level. If an operator's error or unit malfunction occurs while in use, a message will be displayed on the front screen displaying the probable cause. With this feature, no erroneous blood pressure or pulse should be given.




**Power Requirements:** 115 - 230 VAC 50 - 400 Hz or internal battery
(When batteries charge from 115 VAC 400 Hz power, expect 5 hours for charging.)

**Comments:** The Model BPI 420 complied with all test requirements. Radiated and conducted emissions were below the limits established by MIL-STD-461B. Leakage currents were within the limits imposed by Air Force Regulation 160-3 for Class A equipment. After completion of the high temperature storage test, Procedure II, the aluminum panel became unglued from the case at the corners.

The Medtek BPI 420 is acceptable for use in an aeromedical evacuation environment.

# UNACCEPTABLE

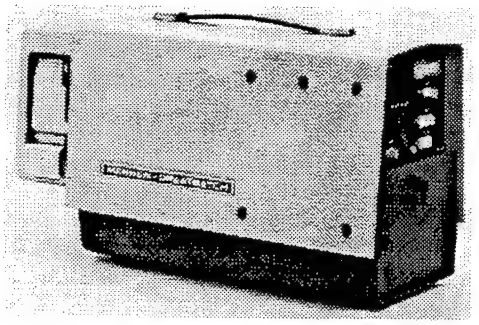
## CARDIAC

## MENNEN-GREATBATCH CARDIO/PAK 936SR MONITOR DEFIBRILLATOR/SYNCHRONIZER AND RECORDER

**Mennen-Medical Inc.**
**10123 Main Street**
**Clarence, NY 14031**
**(716) 759-6921**

**Evaluation Date:** September 1 1980

**Description:** The Cardio/Pak 936SR is a portable ECG monitor, defibrillator and recorder. The unit has an internal synchronizer for performing synchronous countershock when the ECG is monitored with electrodes and a patient cable. The ECG signal can be obtained through the defibrillator paddles or by use of ECG electrodes and patient cable. The 936SR features a non-fade ECG display with a four second memory. It also incorporates a "hold" feature which permits the ECG waveform to be stopped and held on the screen for examination. The defibrillator can provide up to 320 Joules of delivered energy. An energy level meter is provided and indicates deliverable and stored energy levels.



**Power Requirements:** 115 VAC 60 Hz, 12 VDC power or Battery

**Comments:** Failed EMI, vibration and temperature testing.

# UNACCEPTABLE

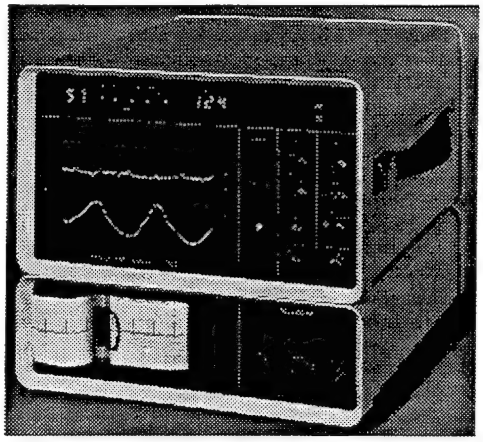
## CARDIAC

## MENNEN-GREATBATCH NEONATAL MONITOR 744 AND 700-150 CHART RECORDER

**Mennen Medical Inc.**
**10123 Main Street**
**Clarence, NY 14031**
**(716) 759-6921**

**Evaluation Date:** September 1 1980

**Description:** The Mennen-Greatbatch Neonatal Monitor 744 and 700-150 chart recorder is a compact, lightweight portable neonatal monitor. It will monitor adult or neonatal ECG and heart rate, respiration and apnea, and blood pressure or temperature. The chart recorder offers continuous timed and alarm waveform recording capabilities. The unit will operate from an internal rechargeable battery or from AC line power. The battery normally allow 0.75 hours of operating time before recharging becomes necessary. The unit incorporates digital displays to indicate the measured patient parameters and non-fade displays to present the ECG, blood pressure or respiration waveforms. Automatic lead fault detection provides helpful indication of loose or detached electrodes.



**Power Requirements:** 115 VAC 60 Hz or Battery

**Comments:** Failed EMI, vibration and humidity testing.

# ACCEPTABLE

**CARDIAC**

## MONOPULSE 807B DEFIBRILLATOR WITH ELECTROCARDIOSCOPE, PACEMAKER, AND SYNCHRONIZER

**Travenol Laboratories, Inc.**
**Deerfield, IL 60015**

**Evaluation Date:** February 1 1971

**Description:** The Monopulse 807B is comprised of: 1) a defibrillator, providing an undamped DC pulse with a "50%" duration of 7 to 8 milliseconds with delivered energy levels ranging from 0 to approximately 200 watt-seconds depending on patient load; 2) a pacemaker for internal or external use, delivering a rectangular pulse of approximately 2 milliseconds duration at rates variable from 20 to over 120 pulses per minute with outputs ranging from 2 to 250 volts; 3) a synchronized arrhythmia conversion system utilizing the defibrillator and a synchronizing circuit to permit triggering the defibrillator discharge by the R wave; and 4) an electrocardioscope capable of displaying signal wave forms from standard limb leads and provided with a millivolt calibration input circuit and an output jack socket for coupling to remote ECG equipment.

Sorry, no picture available.

**Power Requirements:** 100-125 VAC 50-400Hz or internal battery

**Comments:** The physician-in-charge and user should be cognizant that the electrocardioscope will probably be rendered inoperable if a rapid decompression of the cabin should occur.

# UNACCEPTABLE

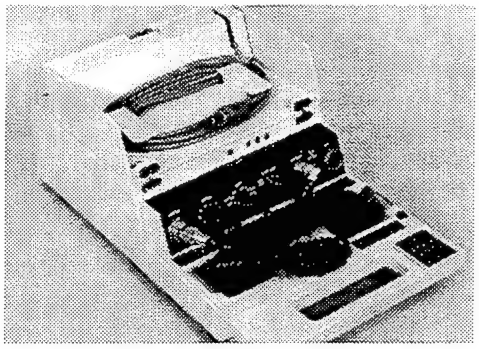
## CARDIAC

## MOTOROLA ADVANCED PORTABLE DUPLEX CORONARY OBSERVATION RADIO (APCOR)

**Motorola, Inc.**
**8000 W. Sunrise Blvd.**
**Ft Lauderdale, FL 33322**
**(305) 475-5490**

**Evaluation Date:** June 1 1983

**Description:** The advanced portable duplex coronary observation radio (APCOR) is a battery operated transmitter and receiver with ECG encoding circuits for transmitting ECG telemetry to the hospital from the patient in the field. The transmitter and receiver contain "Private-Line" (PL) tone coded squelch circuitry. Up to eight RF channels (12 Watt output) are provided, with separate frequencies for transmitting (468.000 - 468.175 MHz) and receiving (463.000 - 463.175 MHz), permitting simultaneous transmitting and receiving on each channel. A handset with a microphone and headphone permits semi-private voice conversation with the hospital.



**Power Requirements:** 115 VAC 60 Hz for rapid charger unit and to recharge battery in telemetry unit. Rechargeable Ni-Cad battery pack

**Comments:** Failed EMI testing.

# ACCEPTABLE

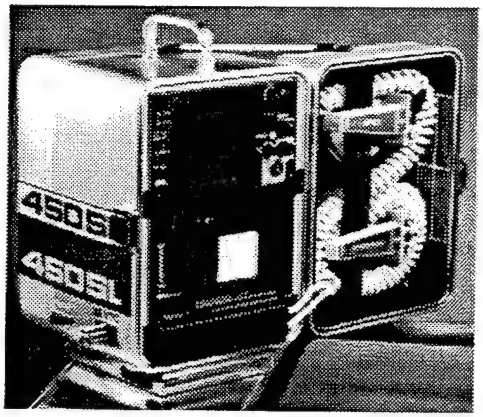
**CARDIAC**

## MRL 450 SL-AF MONITOR, DEFIBRILLATOR/SYNCHRONIZER, RECORDER

**Medical Research Laboratories, Inc.**
**7450 Natchez Ave.**
**Niles, IL 60648**
**(312) 792-2666**

**Evaluation Date:** December 1 1979 & March 1 1985

**Description:** The MRL 450-SL-AF is a portable monitor/defibrillator/recorder that can be operated on the power sources listed below. The unit contains an internal battery charger that operates on any of the power sources. The entire unit and accessories are self-contained in a single carrying case. The carrying case is made of rugged, stressed aircraft aluminum and is ideally suited for transport. The ECG monitor has a 5 inch non-fade scope, a digital heart rate display, a hold push button for analyzing ECG signals, and output jacks providing 1 millivolt, 1 V and 1400 Hz modulated tone ECG signals (not tested). The lead select control allows selection of Leads I, II, III or "quick-look" paddle configurations. The ECG size control can be adjusted to automatic gain or three fixed gain settings. The QRS beeper volume and QRS sensitivity can be adjusted from the monitor control panel. The monitor also has the approved options of a High/Low heart rate alarm and a battery test function which displays the percentage of battery life remaining. The defibrillator/synchronizer can provide up to 360 joules of delivered energy in eight discrete levels. All defibrillator controls, including a low battery indicator and remote chart recorder are located on the defibrillator paddles. The defibrillator paddles and accessories are mounted in the carrying case lid. The recorder documents ECG waveforms in either real time or 4 second delay (optional); both are approved for use. The recorder can be activated from either the recorder panel or the defibrillator paddle.




**Power Requirements:** 115 VAC 60-400 Hz, 28 VDC external; 12 VDC external, 12 VDC internal battery

**Comments:** First tested in DEC 79 under AMB Pak 450-SL Monitor file name.
Once the defibrillator has been charged, merely turning off the MRL will not release the charge. The paddles must be discharged into the paddle placement location in the MRL cover. Do not discharge into the air or by holding the paddles together.

# UNACCEPTABLE

## CARDIAC

## OMEGA BLOOD PRESSURE MONITOR, MODEL 5000-110

**Invivo Research Laboratories**
**3061 West Albany Street**
**Broken Arrow, OK**
**74012**
**(918) 250-0566**

**Evaluation Date:** March 1 1987

**Description:** The Omega 5000 blood pressure monitor automatically measures a patient's systolic, diastolic, and mean arterial blood pressures (BP) at pre-set intervals. The average pulse rate is also determined at the time of BP measurement and displayed on the front panel of the monitor along with the pressure values. Measurements are based on the oscillometric principle. Cuff pressure oscillations are monitored as cuff pressure decreases, with the systolic pressure, diastolic pressure, and mean arterial pressure (MAP) determined by analysis of the cuff pressure and oscillation readings. Alarm limits for systolic, diastolic, and MAP are set individually with the HISET and LOSET controls in conjunction with the ALARM SELECT switch. An alarm tone and visual signal are triggered whenever the BP parameter alarm limit is violated. The alarm sounds for 16 seconds; then another BP measurement is taken. If the alarm limits are again violated after the new reading, the alarm tone reactivates, alternating with pressure reading cycles until within limits or HOLD switch is pressed. The operator can take manual control of the system at any time using START and HOLD. Longer intervals between measurements can be selected, or pressure readings can be made upon demand. If the manual Manometer Mode is selected, the cuff mode is selected, the cuff can be inflated with an optional hand bulb, and BP measurements made via auscultatory techniques. During normal operation the displayed blood pressure and pulse rate indicate the patient's condition at the time of the last measurement. A number of cuff sizes are available as accessories. Convenient indexing lines are printed on the cuffs to assist with correct sizing.

**Power Requirements:** 120 VAC 60 Hz or Battery

**Comments:** Failed EMI testing.

CONDITIONAL

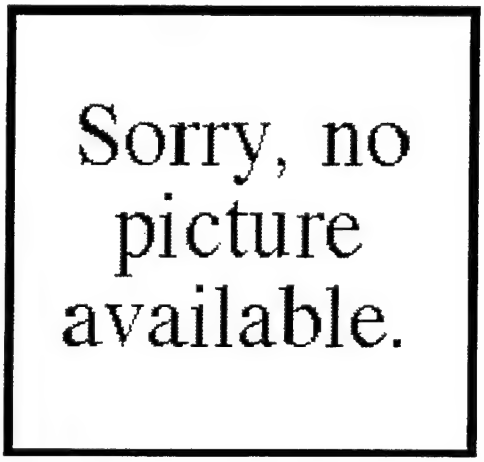
**CARDIAC**

# PHYSIO-CONTROL ELECTROCARDIOGRAPH RECORDER

**Physio-Control Corporation**
**11811 Willows Rd.**
**Redmond, WA 98502**
**(800) 426-8047**

**Evaluation Date:** December 1 1974

**Description:** The Physio-Control portable, battery or AC operated, ECG recorder is a solid-state recorder having the latest electronic isolation circuitry. The unit is 270 mm high x 300 mm wide x 125 mm thick (10.7" x 12" x 5") and weighs 8.4 Kg (18.5 pounds). The recorder is powered by an internal rechargeable battery or from 115 VAC 60-400 Hz power. The recorder comes with an isolated patient standard 7 lead cable, a cable for connecting the recorder to the Lifepak 3 unit, and an AC power cable. The recorder and accessories are contained in a soft zipper case.




**Power Requirements:** 115 VAC 60 - 400 Hz or Battery

**Comments:** Waiver was granted for use on aeromedical evacuation aircraft August 1974. The third wire (ground) of the recorder's AC power cable and AC outlet should be checked for low-resistance (0.15 ohms or less) continuity before using the recorder on or near electrically susceptible patients.

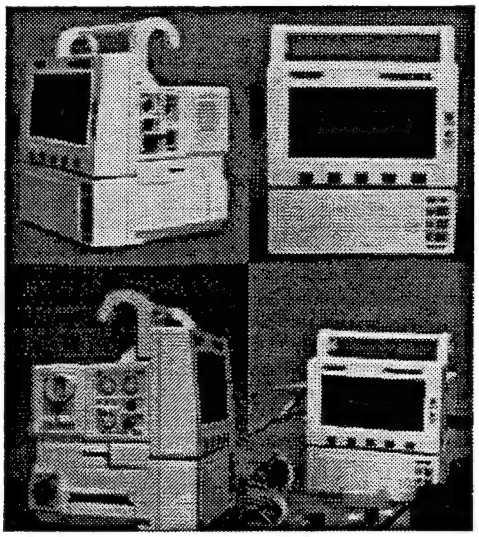
# ACCEPTABLE

## CARDIAC

## PROPAQ VITAL SIGNS MONITOR MODEL 106

**Protocol Systems, Inc.**
**14924 N.W. Greenbrier Parkway**
**Beaverton, OR 97006**
**(800) 289-2500 or**
**(503) 645-2500**

**Evaluation Date:** February 1 1991



**Description:** This device can monitor electrocardiograph (ECG), non-invasive blood pressure, and temperature. It also features an ECG recorder. Additional capabilities exist, but the evaluated model passed electromagnetic interference (EMI) testing only with those features listed and with some modifications.

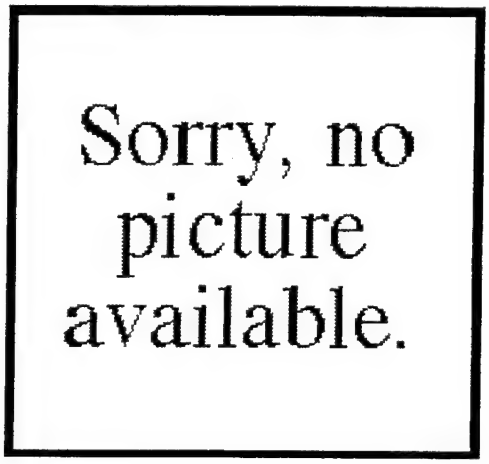
**Power Requirements:** 120 VAC, 60 HZ, 0.2 amps or Lead acid battery with internal charger

**Comments:** To be used inflight, the 106 must be modified to comply with MIL-STD-461C EMI standards; and must be so labeled.

| UNACCEPTABLE | CARDIAC |
|---|---|
| **SOMATRONIX DIGITAL BP AND PULSE MONITOR, MODEL 307** | **Somatronix Address (Unknown)** |

**Evaluation Date:** January 23 1980

**Description:** Not available in record.

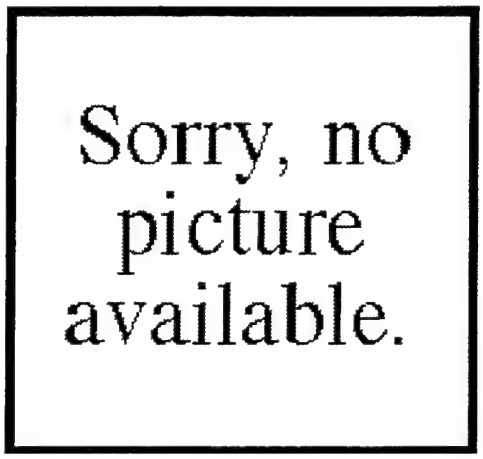



**Power Requirements:** Battery

**Comments:** Failed inflight testing, no further testing accomplished. Adversely affected by aircraft noise and vibration.

| UNACCEPTABLE | CARDIAC |
|---|---|
| **SPACELABS VITAL SIGNS MONITOR** | **Space Labs, Inc.**<br>**P.O. Box 97013**<br>**Redmond, WA**<br>**98073-9713**<br>**(206) 882-3700** |
| **Evaluation Date:** January 27 1992 | |

**Description:** The Spacelab Model 90308 bedside/Transport Monitor is an advanced microcomputer system designed to provide multi-parameter monitoring information processing either at the patient's bedside or during transport. It has a 9-1/4 inch diagonal electroluminescent display with an infrared touch screen, with three standard physiological waveforms displayed on screen, with a fourth waveform optional; and will monitor up to 11 parameters. It provides 1, 2, 6, 12, and 24 hour trends on all parameters with one minute resolution. It has a movable trend cursor that pinpoints exact parameter value and time. Three replaceable batteries provide up to 2.5 hours of portable monitoring. The triple-stage battery charger recharges to 80% in 80 minutes, and 100% capacity in three hours.




**Power Requirements:** Internal batteries

**Comments:** Failed EMI testing. No further test completed.

# UNACCEPTABLE

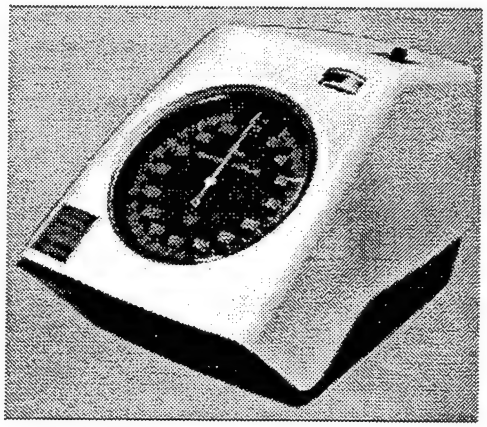
## CARDIAC

## SPHYGMOSTAT ELECTRONIC BLOOD PRESSURE MONITOR, MODEL B-350

**Technical Resources, Inc.**
**Sphygmostat Division**
**600 Main Street**
**Waltham, MA 02154**
**(617) 899-3741**

**Evaluation Date:** September 6 1976

**Description:** This unit allows accurate, rapid measurement of blood pressure without the need for a stethoscope. A special microphone in the cuff detects the Korotkow sounds as the cuff is deflated; these signals are processed electronically, flashing a red light on the instrument panel. The pressures on the manometer corresponding to the first and last flashes represent systolic and diastolic pressures respectively. The cuff is applied snugly with the microphone over the brachial artery. The instrument is switched on and the cuff rapidly inflated to a point above systolic. The cuff should then be deflated at the rate of approximately 2-3 mm Hg per pulse; this rate avoids a fast drop in the pressure, which may cause an incorrect systolic reading, while it is fast enough to avoid short secondary build-ups in the artery ("standing waves") which may cause erroneous diastolic readings. The first flash on the dial occurs at systolic pressure, the light will flash synchronously with the pulse until diastolic is reached, and the last flash is the diastolic pressure.



**Power Requirements:** Battery

**Comments:** Failed inflight testing. Erratic operational characteristics.

# UNACCEPTABLE

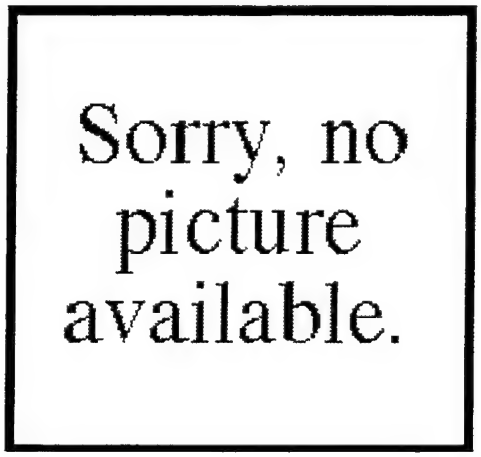
**CARDIAC**

## SPHYGMOSTAT MODEL B-300 ELECTRONIC BLOOD PRESSURE MONITOR

**Technical Resources, Inc.**
**Sphygmostat Division**
**600 Main Street**
**Waltham, MA 02154**
**(617) 899-3741**

**Evaluation Date:** July 23 1970

**Description:** Not available in record




**Power Requirements:** AC power or Battery

**Comments:** Failed human factors. In the present configuration, the Sphygmostat Model B-300, electronic blood pressure monitor, has several deficiencies and characteristics that make it unacceptable for aeromedical airlift operations. In brief, the unit demonstrated unsatisfactory operation on a cursory test aboard a C-131 aircraft; the unit is not constructed for routine use on aircraft; the unit circuitry does not provide an adequate degrees of electrical safety when in the battery charging mode; and the unit does not provide adequate readability on dimly lighted aircraft. The unit was not adversely affected by environmental variations, nor did it produce electromagnetic interference (EMI). However, due to failure of human factors evaluation the unit is unacceptable for aeromedical use.

# UNACCEPTABLE

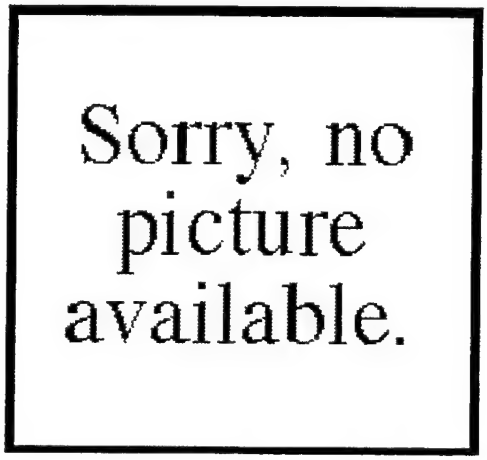
**CARDIAC**

## SPHYGMOSTAT MODEL P-75, PULSE MONITOR

**Technical Resources, Inc.**
**Sphygmostat Division**
**600 Main Street**
**Waltham, MA 02154**
**(617) 899-3471**

**Evaluation Date:** June 18 1970

**Description:** Not available in record




**Power Requirements:** 110 VAC or Battery

**Comments:** The Sphygmostat, Model P-75, Pulse monitor has several deficiencies and characteristics that render it unacceptable for aeromedical airlift operations. The unit provided for test was electrically hazardous, the inflight operational performance was inadequate, the electrical workmanship was of poor quality, and the meter readability was unsatisfactory.

CONDITIONAL

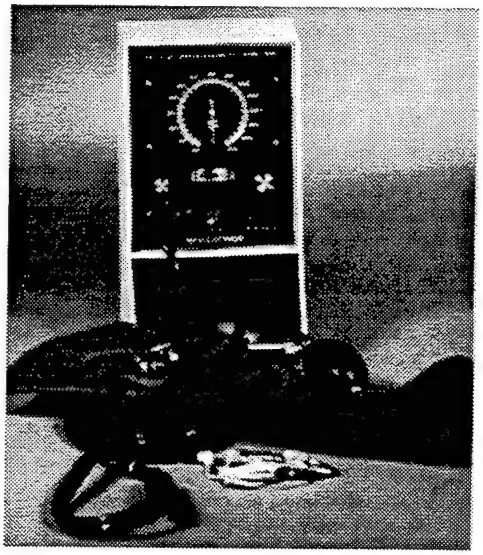
CARDIAC

# SPHYMETRICS INFRASONDE ELECTRONIC BLOOD PRESSURE MONITOR, MODEL M3010

**Sphymetrics, Inc.**
**6311 Desoto Ave. Suite J**
**Woodland Hills, CA 913467**
**(213) 827-9000**

**Evaluation Date:** June 1 1980

**Description:** The Infrasonde Model M3010 is an electronic sphygmomanometer which comprises a system for measuring both the systolic and diastolic blood pressures using the pulse detection method. Unique pulse-processing circuitry in the M3010 Monitor modulates the tones to help the operator better distinguish those that represent systolic onset and diastolic endpoint. Sensitivity is adjustable over a wide range to cope with patients of all ages and conditions. The monitor goes on and off automatically with cuff inflation and deflation, eliminating the need for an on-off switch.



**Power Requirements:** Internal battery

**Comments:** Based on the results of the tests conducted, the Infrasonde can be considered acceptable for use onboard fixed wing aircraft used for aeromedical evacuation. The unit, however, is not recommended for use onboard Air Rescue & Recovery Service helicopters due to interference from aircraft vibration.

# UNACCEPTABLE

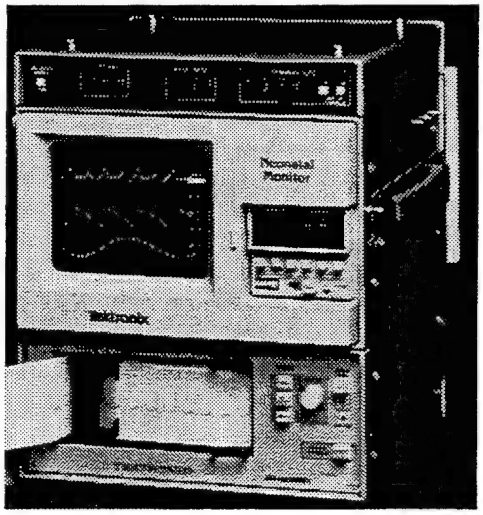
**CARDIAC**

## TEKTRONIX 413 PORTABLE NEONATAL MONITOR, OPTION 82 400 SERIES RECORDER, OPTION 4

**Tektronix, Inc.**
**P.O. Box 500**
**Beaverton, OR 97005**
**(800) 547-8805**
**(503) 644-0161**

**Evaluation Date:** December 1 1978

**Description:** The Tektronix 413 portable neonatal monitor, Option 82, is a recorder-equipped monitor. The 400 series recorder is Option 4 to match the 413 series patient monitor and requires no separate power or external interconnect wiring. It operates directly from the monitor's internal Ni-Cad battery pack. The 413 evaluated displays the electrocardiogram (ECG), heart rate, and respiration. The digital readout displays heart rate or respiration rate. Either may be selected at any time during use. A three-trace display provides simultaneous viewing of ECG, pulse, and respiration waveforms. The traces are automatically positioned for the mode of operation selected with trace intensity and focus internally preset.



Adjustable alarm limits are provided for heart rate and respiration rate. Independent controls are provided for heart rate and respiration rate. Independent controls are provided for continuous-tone-alarm loudness and for beat-tone. Separate QRS and inspiration detectors provide information for rate alarms, rate digital displays, and sweep triggering. A pulse alarm indicates pulse or pressure failure. Other features are a color-changing light emitting diode (LED) to indicate battery condition, and a "Hospital Grade" power plug.

The 400 series recorder, Option 4, provides a single-channel waveform writing of the selected patient parameters at two selectable chart speeds (25 or 50 mm/sec.) Its display is ALWAYS one half the amplitude of the monitor display. It also provides an alphanumeric printout, with every record cycle, of patient vital signs and elapsed time. A stylus heat control is provided for adjustment of copy darkness. The recorder can be set to record every 15 minutes, to start when the monitor alarms, or manually. Only Tektronix recording paper should be used with the recorder.

**Power Requirements:** 115 VAC, 48-440 Hz line power and four (4) F-cell Ni-Cad batteries

**Comments:** Failed EMI, vibration and environmental testing.

# UNACCEPTABLE

**CARDIAC**

## TEKTRONIX MODEL 413A NEONATAL MONITOR

**Tektronix, Inc.**
**P.O. Box 500**
**Beaverton, OR 97005**
**(800) 547-8805**
**(503) 644-0161**

**Evaluation Date:** January 1 1983

**Description:** The portable neonatal monitor, digital readout module and recorder is a three-trace portable patient monitor that simultaneously displays ECG, blood pressure or peripheral-pulse and respiratory-effort waveforms. A selectable digital readout shows heart rate, respiratory effort rate, systolic/diastolic and mean blood pressure, and either of two temperatures. The recorder is a strip chart recorder which provides single channel waveform writing of selected patient parameters. In the test version both the digital readout module and the recorder were "married to the monitor".

Sorry, no picture available.

**Power Requirements:** 115 VAC 60 Hz or Internal rechargeable battery pack

**Comments:** Failed vibration and EMI testing.

CONDITIONAL

CARDIAC

# TEKTRONIX PHYSIOLOGICAL MONITOR, TYPE 410

Tektronix, Inc.
P.O. Box 500
Beaverton, OR 97005
(503) 644-0161

**Evaluation Date:** January 1 1972

**Description:** The Tektronix Type 410, Physiological Monitor, is a portable, battery operated single trace oscilloscope designed for long-term monitoring of ECG, EEG, or pulse waveform. Other features include triggered sweep-related heart rate signals, direct heart rate readout, an audible signal at the heart rate, high common-mode rejection and fast overdrive recovery.

Sorry, no picture available.

**Power Requirements:** 90-136 VAC & 180-272 VAC 48-440Hz or Internal battery

**Comments:** The Tektronix Type 410, Physiological Monitor, is acceptable for routine use on aeromedical aircraft. The physician-in-charge and the user organization should be cognizant that the unit will probably be rendered inoperable if a rapid decompression of the aircraft cabin should occur. Because of the excessive leakage currents from the monitor, the Type 410 monitor should not be used for patients having devices whose terminal end is introduced into the thorax and is consecutively connected to a point accessible outside the body (such as a probe, catheter, or electrode).

# ACCEPTABLE

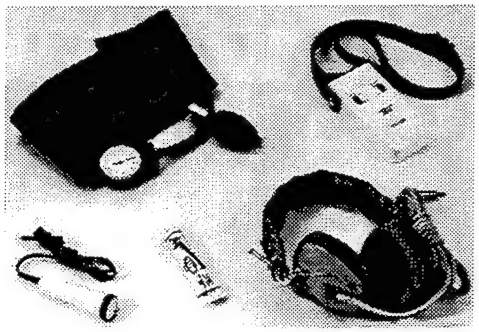
## CARDIAC

## ULTRASONIC MONITOR, HEMOSONDE MODEL 2300

**Parke-Davis and Company**
**Medical Instruments Division**
**180 Bear Hill Rd.**
**Waltham, MA 02154**

**Evaluation Date:** August 14 1973 & September 12 1976

**Description:** The Model 2300 Hemosonde is an ultrasonic doppler device, operating at a frequency of 5 MHz. The device was designed to detect fetal heart sounds and blood flow. It consists of an amplifier unit which contains the audio circuitry, controls and batteries; a shielded probe which contains the RF transmitting and receiving circuitry, demodulator circuitry and the receiving and transmitting piezoelectric transducers; and two headsets for output monitoring. The standard sphygmomanometer was modified by providing a transducer mount which is installed through both the bladder and cuff. The transducer mount allows the transducer of the Hemosonde to be positioned above the occluded segment of the brachial artery.



**Power Requirements:** Internal batteries

**Comments:** Based on test results the device meets all the criteria for inflight monitoring of patients blood pressure and test criteria for portable electronic devices used on aircraft.


# AEROMEDICAL RESEARCH STATUS GUIDE

## INCUBATORS

- AIRBORNE INFANT LIFE SUPPORT SYSTEM (ILSS)
- AIRBORNE LIFE SUPPORT SYSTEMS (ALSS)
  INFANT TRANSPORT INCUBATOR, MODEL ALSS 185
- AIRBORNE LIFE SUPPORT SYSTEM (ALSS) TRANSPORT
  INCUBATOR, MODEL 20H (NTS)
- AIR-SHIELDS (ISOLETTE) TRANSPORT INCUBATOR, MODEL TI-58
- ARMSTRONG CARE-ETTE ISOLATION INCUBATOR, MODEL 190A
- HEALTHDYNE INFANT TRANSPORT SYSTEM
- INTERNATIONAL BIOMEDICAL CORP
  NEONATAL TRANSPORT SYSTEM (NTS) (ALSS MODEL 20H)
- MISTOGEN TRANSPORT INCUBATOR, MODEL TI-700
- NARCO AIR-SHIELDS INFANT INCUBATOR,
  MODEL TI-100-1 & T167-1
- OHIO AIR-VAC TRANSPORT INCUBATOR WITH BATTERY PACK
- SEIRRACIN CRADLE WARMER, MODEL 121800
- VICKERS TRANSPORT INCUBATOR, MODEL 77

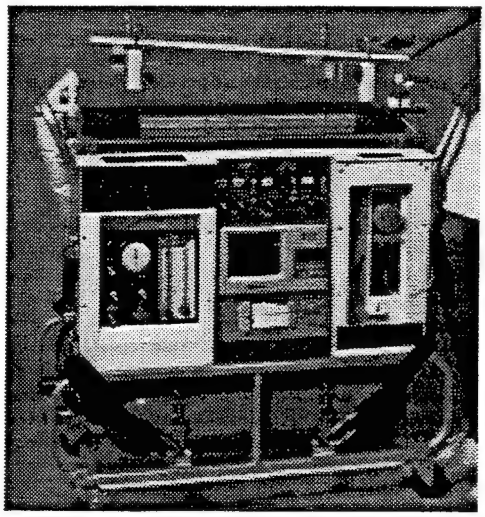
# UNACCEPTABLE

## INCUBATORS

## AIRBORNE INFANT LIFE SUPPORT SYSTEM (ILSS)

**Airborne Life Support Systems, Inc.**
**512 South Freeway**
**Fort Worth, TX 76104**
**(800) 433-5615**
**(812) 338-0451**

**Evaluation Date:** May 1 1986



**Description:** The Airborne Infant Life support System (ILSS) is a neonatal transport incubator that provides uninterrupted neonatal intensive care. Built-in components include a Vitatek Model 413A physiological monitor with chart recorder, a Bio-Med MVP-10 neonatal ventilator, an integral infusion pump, and a Laerdal suction unit.

**Power Requirements:** 115 VAC 60-400 Hz, 28 VDC or internal battery

**Comments:** Failed EMI testing. No further tests conducted.

CONDITIONAL

# INCUBATORS

## AIRBORNE LIFE SUPPORT SYSTEMS (ALSS) INFANT TRANSPORT INCUBATOR, MODEL ALSS 185

**Airborne Life Support Systems**
**International Biomedical Inc.**
**7651 Airport Blvd.**
**Houston, TX 77061-4098**
**(800) 433-5615**
**(812) 338-0451**

**Evaluation Date:** October 1 1988 & March 1 1990

**Description:** The Model ALSS 185 provides a controlled environment to support an infant's thermal needs during transport, by circulating warmed, humidified air through the chamber. The battery operates the unit for up to 3.5 hours (following 6 hours of charging on 110 VAC) and up to 3 hours (following 6 hours of charging on 110 VAC 400 Hz), while maintaining an infant chamber temperature of 37 degrees C (98.6 degrees F). A digital temperature display along with numerous alarm conditions are incorporated into the unit.

Sorry, no picture available.

**Power Requirements:** 115 VAC 50 - 400 Hz, 3.0 amps, 12 - 14.5 VDC or Internal battery 12-24 VDC Sealed Lead acid

**Comments:** This unit is susceptible to significant increases in temperature within the infant chamber, when exposed to direct sunlight. This can be avoided by covering the clear plexiglass hood assembly with an item such as a folded cotton bed sheet. Unless absolutely necessary, do not remove the hood assembly, as it can separate and fall on the infant, the aircraft floor, another patient or crewmember. The USAF Occupational and Environmental Health Laboratory (OEHL) at Brooks AFB, Texas, determined the noise levels within the incubator while on the C-9, C-12, C-21, C-130, C-141 aircraft and UH-1 helicopter, were not loud enough to produce a significant risk to hearing damage; due to the relatively short period of exposure. Currently, there is no commercially available hearing protection equipment for infants. OEHL advises not taping ear plugs over infant's ears, as it is of little to no value. An oxygen analyzer should be used whenever supplemental oxygen is used. The Model 185 was retested for EMI in March 1990 it had been fitted with an improved brushless air circulation motor, Brailsford model T-2NFR. Using this new motor, the 185 passed EMI and is acceptable for aeromedical use. If more information is required, refer to USAFSAM-TR-89-35 available through the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Rd., Springfield VA 22161. Telephone: (703) 487-4650

CONDITIONAL

# INCUBATORS

## AIRBORNE LIFE SUPPORT SYSTEM (ALSS) TRANSPORT INCUBATOR, MODEL 20H (NTS)

**Airborne Life Support Systems**
**International Biomedical Inc.**
**7651 Airport Blvd.**
**Houston, TX 77601**
**(800) 433-5615**
**(812) 338-0451**

**Evaluation Date:** April 1 1990

**Description:** The ALSS Model 20H provides an infant with a warm environment, fresh air exchange (to prevent C02 buildup), and delivery of supplemental oxygen from an external source.

Sorry, no picture available.

**Power Requirements:** 115 VAC 50 - 60 Hz, 3.0 amp or Internal battery 12 VDC - 24 AH Sealed Lead acid type

**Comments:** This incubator was evaluated as a component of the Neonatal Transport System. The incubator requires modification to conform to MIL-STD-461C, Category A1e. Also, modifications must be made to the hood assembly to keep the inner and outer shells connected together, and to allow for carbon dioxide venting. If the hood side-door is located on the left side, rather then the right, opening of that door should be minimized. Frequent opening will allow the thermostatic sensor located near the door to sense the cooler outside air. This causes the incubator to produce more heat to compensate for the perceived lower temperature, leading to an overheating condition, without alarm activation. To conserve battery life when used on the C-21, the incubator should be prewarmed using AC power, prior to enplaning. Also, during flight , the cabin temperature should be kept as high as possible. An external battery is also available, but it has not been evaluated for aeromedical evacuation use. The Model 20H may be used apart from or as a component of the International Biomedical Neonatal Transport System. For further information see INTERNATIONAL BIOMEDICAL CORP NEONATAL TRANSPORT SYSTEM (NTS) (ALSS MODEL 20H).

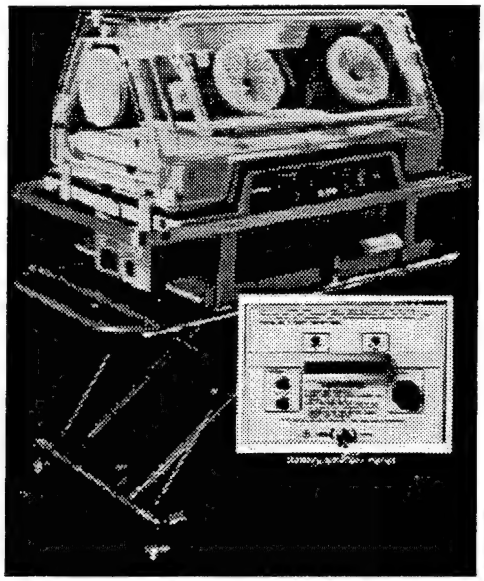
# UNACCEPTABLE

## INCUBATORS

## AIR-SHIELDS (ISOLETTE) TRANSPORT INCUBATOR, MODEL TI-58

**Air-Shields, Incorporated**
**Hatboro, PA 19040**
**(215) 675-5200**

**Evaluation Date:** April 8 1971



**Description:** The Air-Shields Transport Incubator, Model TI-58 is designed to provide a stable environment under adverse ambient conditions during the transport of an infant. It also has controls for temperature, oxygen, and humidity and features a three-way power system.

**Power Requirements:** 110-120 VAC, or 220-240 volt, 50-60 Hz; 12 VDC; Battery Operation-12 volts, rechargeable

**Comments:** Failed EMI and environmental testing, had CO2 build-up, potential fire hazard.

# UNACCEPTABLE

## INCUBATORS

## ARMSTRONG CARE-ETTE ISOLATION INCUBATOR, MODEL 190A

**Ohio Medical Products**
**3030 Airco Dr.**
**P.O. Box 1319**
**Madison, WI 53701**
**(608) 221-1551**

**Evaluation Date:** July 1 1976

Sorry, no picture available.

**Description:** The Armstrong CARE-ETTE Isolation incubator, Model 190A, is a standard incubator specifically designed for hospital usage. It provides a controlled isolation environment for the newborn. Essential temperature, humidity, and oxygen are maintained at precisely uniform levels. The circulation, resulting from air intake capacity, gives positive pressure from within and complete ventilation. The increased inside pressure prevents contaminating room air from entering the incubator hood when the hood doors are closed. Air is circulated by the fan and exits from the base through vents located on all four sides of the bed. This provides an even distribution of air. Air intake is 16 LPM, and the equivalent hood exchange of air is five times per hour. Consists of a transparent hood mounted on a body unit which contains a controlled heating unit, a heat circulation system, a humidity system, an air filter unit, and a 30" infant bed which is adjustable for Trendelenburg, Fowler, and examination positions. It is equipped with an IV stand and protective guard bar. The hood is fabricated of 1/4" plexiglas and is fitted with five hand hole ports, nebulizer inlet, thermometer, and a front opening door with a double acting hinge. The double acting hinge permits the door, when open, to lie flat on top of the hood. The heating unit is individually fused and incorporates a pilot light in the fuse housing to visually indicate a blown fuse. Other power lights on the unit indicate "Power"-white, "heater"-amber, and "high temperature"-red. The high temperature circuit includes a present thermostat to limit the incubator temperature to 100 degrees F and a buzzer that will sound if the limit is reached. the humidity system consists of a "water fill and drain" unit, a humidity control knob, a water reservoir, and a connecting rubber tube. The humidity reservoir and cover are made of case aluminum, are easily removed from the incubator, and can be autoclaved. The filter unit consists of a housing, two filter pads that will remove all airborne particles down to .5 microns, cover, and oxygen inlets.

**Power Requirements:** 110-120 VAC 60 Hz

**Comments:** Failed safety and human factors testing.

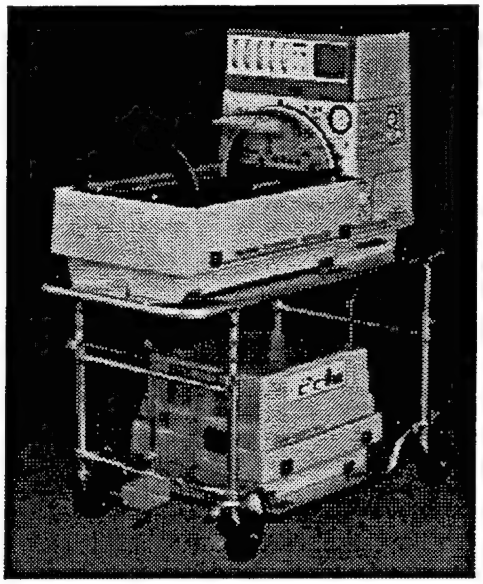
# UNACCEPTABLE

## INCUBATORS

## HEALTHDYNE INFANT TRANSPORT SYSTEM

**Healthdyne**
**2253 Northwest Parkway**
**Marietta, GA 30067**
**(404) 955-9555**

**Evaluation Date:** September 1 1983



**Description:** The system includes a radiant heat incubator module, a life support system (which provides ventilation, air/oxygen blending, suction and peristalic infusion), a monitoring module (for respiration, blood pressure, core temperature and inspired oxygen concentration), and a dual-trace CRT display for ECG and either respiration or blood pressure waveforms. The entire system is mounted on a Transport Cart which includes an energy pack with rechargeable sealed gel cell batteries.

**Power Requirements:** Modules: TI-10 90-135 VAC 50-400 Hz,
TI-11 Positive/negative 12 VDC,
TI-12 Positive/negative 12 VDC,
TI-13 115 VAC, 50-60 Hz

**Comments:** Failed EMI testing.

CONDITIONAL

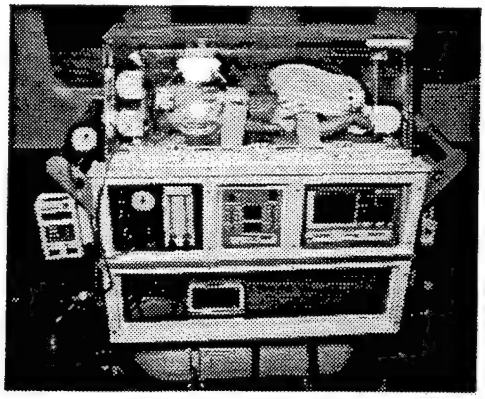
# INCUBATORS

## NEONATAL TRANSPORT SYSTEM (NTS) (ALSS MODEL 20H)

**International Biomedical Inc.**
**7651 Airport Blvd.**
**Houston, TX 77601**
**(800) 433-5615**
**(812) 338-0451**

**Evaluation Date:** April 1 90

**Description:** The NTS was evaluated for use on aeromedical aircraft. However, it is not intended for use as a standard aeromedical evacuation equipment. It is to be used inflight only when operated by trained neonatology personnel. Components evaluated and found acceptable for use in the NTS are listed here:



**Comments:** Crewmembers or neonatology team members may NOT secure themselves to the NTS during take-off or landing. On the C-21, the NTS should be placed on the left side of the cabin. The special mounting system, devised by United States Air Force School of Aerospace Medicine, should be used to secure the NTS to the aircraft. An electrical distribution system is built into the NTS. A single 115 VAC 60 Hz outlet is needed for AC power to system. The C-141 requires a converter/inverter. The C-21 has no AC available, therefore, use internal battery for each component. Acceptable for use on C-9, C-21, C-141 aircraft. Substitutions with other components are not permitted unless evaluated and approved as airworthy. Wooden blocks must be placed under the frame to elevate the unit's wheels off the aircraft floor. Four cargo tie-down straps must be used to secure the NTS.

# Neonatal Transport System (ALSS Model 20H)

## Component & Power Requirements

| COMPONENT | POWER REQUIREMENTS |
|---|---|
| Incubator, ALSS Model 20H | 110 VAC, 3.0 amps or Internal battery<br>Requires EMI & Hood modification |
| Ventilator, Bio-Med Devices | Oxygen-Air 50 psi |
| Neonatal Monitor<br>Corometrics Model MVP-10 | 110 VAC, 0.17 amp or Internal battery Model 506<br>Requires EMI modification |
| Pulse Oximeter, Nellcor<br>Model N-200 | 110 VAC 0.3 amp or Internal battery<br>Requires EMI modification &<br>**Use Battery Only.** |
| Neonatal BP Monitor<br>CAS Medical Systems Model 901 | 110 VAC, 0.13 amp or Internal battery |
| Air-Oxygen Blender, Bird Model 3800A | Air 50 psi, Oxygen 50 psi |
| Suction Unit, Laerdal, Model LSU | 110 VAC, 0.6 amp or Internal battery |
| Oxygen Monitor, MiniOX III | 9 volt alkaline battery |
| Infusion Pump, Travenol Model AS20S | 110 VAC 0.3 amp or Internal battery |
| Pressed Steel Tank, Gas Cylinder<br>Company, Model 3HT1850 | N/A |

# UNACCEPTABLE

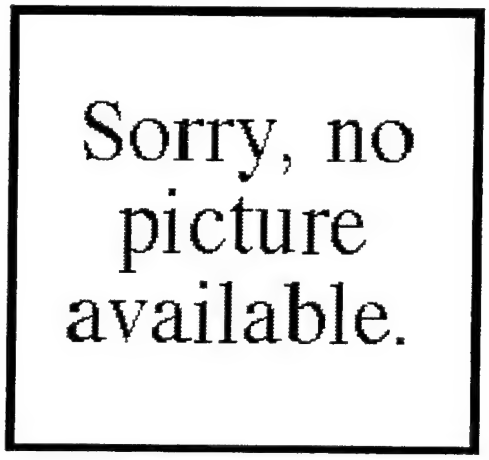
## INCUBATORS

## MISTOGEN TRANSPORT INCUBATOR, MODEL TI-700

**Mistogen Equipment Company**
**2711 Adeline Street**
**Oakland, CA 94607**
**(415) 834-1550**

**Evaluation Date:** July 1 1976

**Description:** The incubator provides solid state temperature control, forced circulation of ambient or oxygen enriched atmosphere, and humidity. The incubator consists of three functional elements, the Service Module, the Bassinet, and the Shell. The Service Module contains all heating, circulating, power source, and regulating controls. It is at the right of the bassinet and shell. All power and electronics are outside the patient compartment. All heating, circulating and the temperature sensor probe are inside the compartment. The bassinet and shell comprise the transport chamber. The bassinet provides transport protection, and uses both a permanent style pad, or disposable air cushion pads. The drop front access door provides additional mattress level visibility and facilitates attendant procedures. The door jam has slots to receive IV's and other service tubes. The IV bottle support stores on the rear of the bassinet. With the access door open the bassinet temperature is essentially maintained by the air flow pattern and sensor placement. The shell provides 360 degrees visibility of the patient and accessibility via two hand ports with closures and wristlets. An oxygen dilutor is located on the left end of the shell. The direct reading thermometer is placed inside for viewing through the shell. The humidifier cylinder clips to the shell at the right rear wall. The shell is removable from the bassinet.




**Power Requirements:** 115 VAC 50-400 Hz, 12 VAC or DC

**Comments:** Failed EMI testing. Unacceptable battery pack, CO2 buildup.

CONDITIONAL

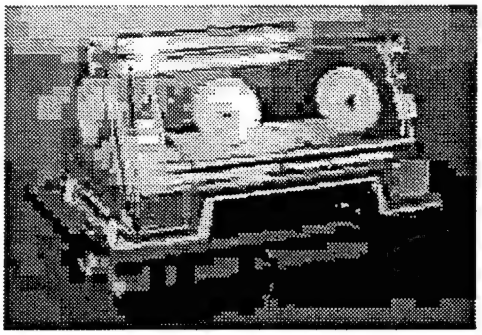
# INCUBATORS

## NARCO AIR-SHIELDS MOBILE TRANSPORT INCUBATOR, MODEL TI-100-1 and T167-1

Narco Air-Shields
505 Masons Mill Business Center
Huntington Valley, PA 19006
(215) 657-6060

**Evaluation Date:** July 1 1981

**Description:** The Narco Air-Shields Transport Incubator is intended for the transport of high-risk premature, low birth-weight, or critically ill newborns. It provides a controlled air temperature from 27 degrees C (81 degrees F) to 38 degrees C (100 degrees F), control of oxygen concentrations up to 85% at a 10 liters per minute flow rate, and a raised relative humidity. A greater than 60% relative humidity can be maintained within the hood for a minimum of 12 hours when the humidity sponge is soaked with 16 oz of water. Effective thermal isolation of the infant from the environment is provided by a double walled hood which also permits full visibility. Front and head access is provided with arm ports and doors; the mattress tray slides out of the head end approximately 25 cm (10 inches) for additional access. Also included is an observation lamp.



**Power Requirements:** 110 VAC 50 - 400 Hz / 28 VDC or battery power (1 hour)

**Comments:** The unit must be modified for EMI. The T167-1 should not be operated on line power (110 VAC 50 - 400 Hz) onboard aeromedical evacuation aircraft. Based on the results of the tests conducted, The Narco Air-Shields Mobile Transport Incubator Model T167-1 is acceptable for use onboard aircraft and helicopters used for aeromedical evacuation. It should be noted that extremely high storage temperatures could render the hood thermometer nonfunctional.

# ACCEPTABLE

## INCUBATORS

## OHIO AIR-VAC TRANSPORT INCUBATOR WITH BATTERY PACK

**Ohio Medical Products**
**3030 Arco Dr**
**P.O. Box 1319**
**Madison, WI 53701**
**(800) 345-2700**

**Evaluation Date:** June 1 1975

**Description:** The units consists of the incubator enclosure, Heater-Pak heating unit, and an accessory portable rechargeable battery power-pak. The heater-pak unit can be removed from the incubator enclosure for cleaning and servicing. The control panel contains all necessary controls for selection of power supply voltage and incubator temperature adjustment. A safety thermostat, located with the heater-pak limits the maximum attainable incubator air temperature to a factory preset level of 99-100 degrees F. The red "high temperature" light on the control panel turns on informing the operator when the incubator air temperature reaches the preset level. There are two hand-access doors on the front panel of the incubator plexiglas hood. On the head-end plate of the incubator a large rectangular door allows access to the infant's head and shoulders. An oxygen cylinder, size D or E, can be inserted and locked into the incubator body to provide a portable source of oxygen.

**Power Requirements:** 110 VAC 60 - 400 Hz, 2.0 amps or 12 VDC External battery pack ( requires 2.0 amps when charging from 110 VAC) or 24 VDC

**Comments:** Based upon test results, the Air-Evac Transport Incubator is acceptable for use on USAF aeromedical flights. On units produced prior to 1975 and having serial numbers beginning with AKH, a sticker label stating "Temperature Warning: Check infant compartment temperature" should be in place next to the temperature warning light on the heater and should cover up the "high temp warning."

| UNACCEPTABLE | INCUBATORS |
|---|---|
| **SEIRRACIN CRADLE WARMER, MODEL 121800** | **The Sierracin Corporation<br>12780 San Fernando Rd<br>Sylmar, CA 91342** |

**Evaluation Date:** January 25 1970

**Description:** Not available in record.

Sorry, no picture available.

**Power Requirements:** Not recorded

**Comments:** Failed EMI. In the present configuration, the cradle warmer, model 121800, has several deficiencies that make it unacceptable for aeromedical airlift. In brief, the audible alarm produces unacceptable electromagnetic interference; mattress expansion could throw an infant against the canopy during rapid decompression; transport handles and tiedown fixtures are not provided; there are no restraints to protect the infant occupant. Of less concern is the fact that the following are not in accord with the manufacturer's specifications: temperature dial control data; the overheat light and alarm limit; underheat light activation point. The cradle warmer can be made minimally acceptable for aeromedical airlift use with relatively minor modifications.

# UNACCEPTABLE

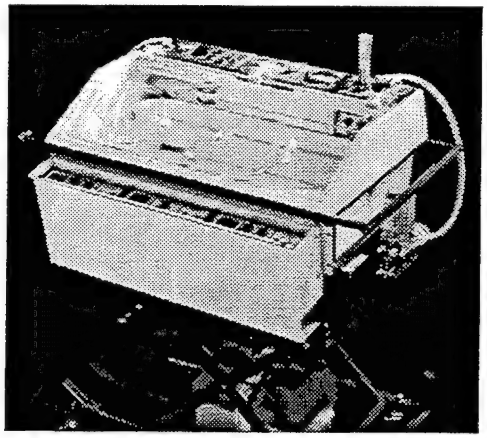
## INCUBATORS

## VICKERS TRANSPORT INCUBATOR, MODEL 77

**Vickers America Medical Corp.**
**P.O. Box 101 U.S. HWY. No. 22**
**Whitehouse Station, NJ 08889**
**(201) 534-4187**

**Evaluation Date:** December 3 1981

**Description:** The Vickers transport incubator was designed to enable preterm and or critically ill neonates to be taken to central specialized hospitals where facilities and staff are available for necessary intensive care. This unit incorporates an integral ventilator, air/oxygen supply and optional monitoring facilities. Has an easily removable baby compartment, large enough to take infants up to 12 lbs and access is either through the two hand ports or by raising the whole canopy. An interior light and drawers are built in for storage of instruments and supplies. The lightweight compact design and collapsible stand with battery and charging unit make handling easy. Audio/Visual alarms are included to warn of overheating and fan failure. Monitors are available for temperature, oxygen concentrations, heart rate and other vital signs.



**Power Requirements:** 210/250 VAC/100 VAC or 105/125 VAC 100 VAC or 12V, DC. 100W nominal

**Comments:** Failed EMI testing.


# AEROMEDICAL RESEARCH STATUS GUIDE


## INFUSION

- ACCUMED TM IV DELIVERY SYSTEM
- ARM-A-FLOW IV FLOW REGULATOR / 3M IV FLOW REGULATOR
- AUTOMATIC IVAC MODEL 500, SELF-REGULATING IV INFUSION PUMP
- AVI GUARDIAN VOLUMETRIC CONTROL DELIVERY SYSTEM, MODEL 100
- BAXTER AS*2F AUTOSYRINGE
- BAXTER CONTROL-A-FLO IV REGULATOR
- BIOMED SPRING-ACTUATED INFUSION PRESSOR, CAT #51787
- DIAL-A-FLO DEVICE
- EMERGENCY AND MILITARY INFUSION SYSTEM (EMIS)
- EXTRACORPOREAL INFUSION PUMP, MODELS 1203, 1211
- HARVARD APPARATUS MODEL 2720 SYRINGE INFUSION PUMP
- HARVARD COMPACT INFUSION PUMP, MODEL 975
- HOLTER INFUSION PUMP, MODEL 903 & 911, CHARGER MODEL NO. RP 159
- IMED 922 VOLUMETRIC INFUSION PUMP
- IMED 928 VOLUMETRIC PUMP
- IMED 960 VOLUMETRIC INFUSION PUMP
- IV STAT CONSTANT PRESSURE INFUSER
- IVAC 400 AUTOMATIC SELF-REGULATING IV INFUSION PUMP
- IVAC 500, AUTOMATIC SELF-REGULATING IV INFUSION PUMP, SERIAL NO. 1468
- MINIMED III INFUSION SYSTEM
- MTP MODEL 1001a INFUSION PUMP
- SAM INFUSION PUMP BUBBLE DETECTOR WITH HOLTER INFUSION PUMP
- SIGMAMOTOR TM-20-2 INFUSION PUMP
- SIGMAMOTOR VOLUMET INFUSION PUMP
- TRAVENOL FLO-GARD 6000 VOLUMETRIC INFUSION PUMP
- TRAVENOL INFUSION PUMP, MODEL AS20S
- VIAFLEX PLASTIC IV CONTAINERS

# UNACCEPTABLE

**INFUSION**

## ACCUMED TM IV DELIVERY SYSTEM

**McGraw Laboratories**
**A Division of American Hospital Supply Corporation**
**Irvine, CA 92714**
**(714) 754-2000**

**Evaluation Date:** July 1 1983

**Description:** A shatterproof semi-rigid polyolefin container for intravenous administration of fluids. Company claims polyolefin exhibits virtually no leachability or extractability. Because of this characteristic no other wrapper is required. Accumed is not dependent upon entry of external air during administration. The container collapses as fluid is administered.

Sorry, no picture available.

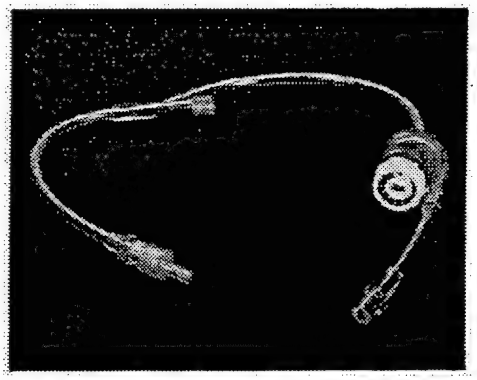
**Power Requirements:** None

**Comments:** Failed altitude testing.

| ACCEPTABLE | INFUSION |
|---|---|
| **ARM-A-FLOW IV FLOW REGULATOR / 3M IV FLOW REGULATOR** | **AVI. Inc.**<br>**3M Health Care**<br>**1120 Red Fox Rd**<br>**St. Paul, MN 55112**<br>**(800) 336-7657** |

**Evaluation Date:** July 1 1988 & December 29 1993

**Description:** The Arm-A-Flow regulator is a gravity-flow infusion device that uses a pressure-sensitive diaphragm in addition to a valve to control intravenous (IV) flow. This regulator is placed between the IV administration set and the catheter, and is an accurate way of controlling the IV flow instead of using the administration set IV tube clamp. In contrast to electronic flow controllers which control the flow by counting the drops, the Arm-A-Flow regulator controls flow by monitoring changes in pressure. The pressure sensitive diaphragm automatically readjust the orifice opening when there is a change in flow so that the difference is accommodated for, and the solution continues to be dispensed at the set rate. The regulator is made of plastic, is disposable and portable, and does not require a power supply. The Arm-A-Flow regulator does not generate a pressure capable of infusion; therefore, maintaining the height of the IV bag at 60.96 - 91.44 cm (24 - 36 inches) above the administration site is essential to this gravity-dependent system.



**Power Requirements:** None

**Comments:** The regulator provides a reliable means of controlling IV drip rates during field operations, when transporting patients, and when a power supply is not available. The regulator is not a replacement for an electronic infusion pump. The height of the IV bag to the administration site must be maintained if used in a gravity-dependent IV set-up. On 12/29/93 The Arm-A-Flow regulator, manufactured under the name 3M IV Flow Regulator, was retested in altitude chamber and found acceptable for use.

| UNACCEPTABLE | INFUSION |
|---|---|
| **AUTOMATIC IVAC MODEL 500, SELF-REGULATING IV INFUSION PUMP** | **IVAC Corporation**<br>**11353 Sorrento Valley Rd**<br>**San Diego, CA 92121**<br>**(714) 453-4320** |

**Evaluation Date:** July 18 1972

**Description:** The IVAC Automatic Self-Regulating IV Infusion Pump, Model 500, uses a photo-electric sensor to monitor every drop as it passes through the drip chamber. Any change in the drop rate is detected by the sensor which automatically adjusts the pump to maintain the preset flow. The instrument provides a selection of drop rate ranging from 1 to 99 drops per minute. When the bottle containing the solution runs out of liquid, or if, for any reason, the selected infusion rate cannot be maintained, the Model 500 will activate the alarm and stop the pump. The alarm is visual and/or audible depending on personal preference.

Sorry, no picture available.

**Power Requirements:** 90 -130 VAC, 55 - 65 Hz

**Comments:** Failed EMI testing.

CONDITIONAL

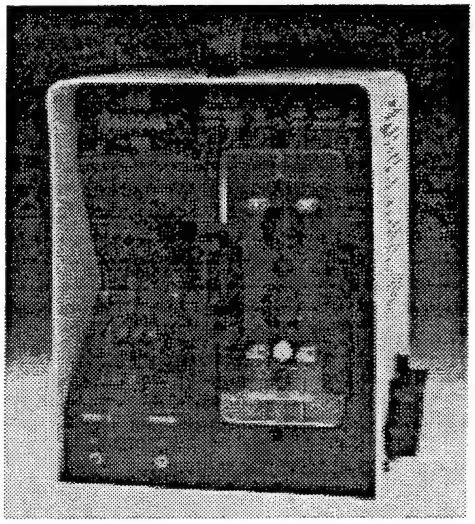
# INFUSION

## AVI GUARDIAN VOLUMETRIC CONTROL DELIVERY SYSTEM, MODEL 100

**AVI. Inc.**
**1118 Red Fox Rd**
**St. Paul, MN 92131**
**(612) 483-2045**

**Evaluation Date:** January 1 1987

**Description:** The Guardian Volumetric Control Delivery System, Model 100, in conjunction with the AVI Guardian IV Administration Set, is designed to automatically regulate the flow rate of most intravenous and/or intraarterial infusions. The unit provides a constant, non-pulsating flow at selected rates from 1 to 999 milliliters per hour (ml/hr) in one ml/hr increments with a volume delivered accuracy of ±2%. The unit has a battery operation time of approximately eight hours at a flow rate of 125 ml/hr (when fully charged). When the unit has delivered the preselected volume to be infused, a visual and audio alarm is activated, and a keep vein open (KVO) rate of 1 ml/hr begins. The unit incorporates an air-in-cassette detector that will detect air bubbles of 0.15 ml or larger.



**Power Requirements:** 115 VAC 50 - 60 Hz, 0.15 amps or Internal battery

**Comments:** Operation of the unit on 115 VAC 400 Hz power is NOT recommended. Use of the Model 100 onboard C-130 and C-141 aircraft should be limited to battery operation, or operation from a frequency converter that provides 115 VAC 60 Hz power. Although the manufacturer's air-in-cassette detector prevented any appreciable air bubbles from passing through the upper pump chamber of the cassette during our evaluation, an in-line filter should still be placed close to the infusion site to remove any air or particles which may occur in the IV fluid. Exposure to subfreezing temperatures for even short periods of time may cause the infusion fluid in the narrow IV tubing to freeze, activating an audio/visual alarm and stopping the fluid flow. To prevent unrestricted flow of IV fluid, always use the manual IV clamp before removing the administration set.

# ACCEPTABLE

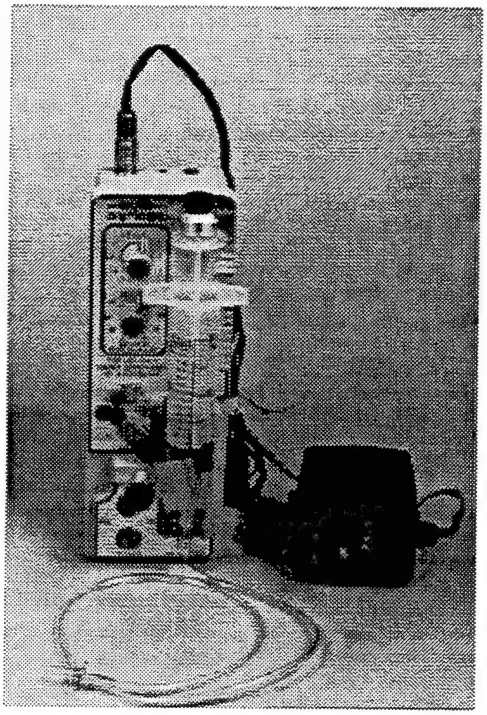
## INFUSION

## BAXTER AS*2F AUTOSYRINGE

**Baxter Health Care Corp**
**(Autosyringe Division)**
**One Baxter Parkway**
**Deerfield, IL 60015**
**(708) 270-5122**

**Evaluation Date:** February 1 1982

**Description:** The Autosyringe Model AS*2F is a portable, battery-powered, programmable infusion pump. The unit delivers a constant infusion by rapidly pulsing many small accurate amounts of medication. It accepts disposable syringes up to 50 ml in overall capacity and can infuse fluids intravenously, subcutaneously, or intraarterially. Fluid delivery can be controlled independently of the main IV flow by connecting the pump to any of the supplemental injection sites available on most IV infusion sets. The Autosyringe AS*2F can infuse from 1 to 44 ml of fluids at infusion rates of 0.5 hours to 49.5 hours, in steps of 0.5 hours.



**Power Requirements:** 115 VAC 60 Hz (not tested on 400 Hz) or Internal battery. Amperage output 0.03 amps

**Comments:** None

# UNACCEPTABLE

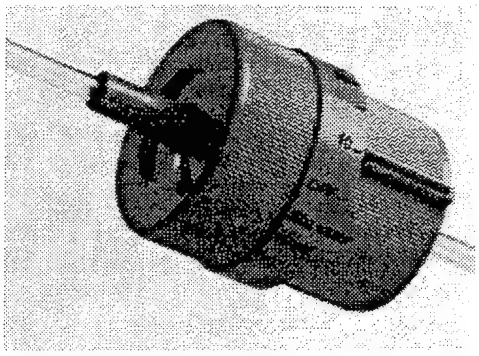
**INFUSION**

## BAXTER CONTROL-A-FLO IV REGULATOR

**Baxter Healthcare Corporation**
**One Baxter Parkway**
**Deerfield, IL 60015**
**(708) 270-5122**

**Evaluation Date:** June 26 1992

**Description:** Maintains virtually consistent flow rates despite changes in head height. Compensates for pressure changes with an internal diaphragm. Eliminates flow rate variations associated with roller clamps and is disposable.



**Power Requirements:** None

**Comments:** Failed Altitude testing. Unable to deliver consistent rates at altitude.

| ACCEPTABLE | INFUSION |
|---|---|
| **BIOMED SPRING-ACTUATED INFUSION PRESSOR, CAT #51787** | **Biomedical Instruments Ltd.**<br>**P.O. Box 26100**<br>**TEL AVIV, ISRAEL 61260** |
| **Evaluation Date:** July 1 1988 | |

**Description:** The SA Pressor allows quick infusion administration from a collapsible plastic bag without the need to hang the bag over the patient. The SA Pressor consists basically of six curved, hardened steel plates. The plates, in two groups of three, are covered by a strong synthetic fabric; the six plates form two large curved plates, fastened at one edge to a common hinge, around which they revolve. A sleeve made from the same synthetic fabric is also attached to this hinge. A long strap is riveted to the free edge of the opposite plate. By pulling the strap the two groups of three plates are pivoted to the closed position. The other pairs of steel plates can be closed together by clamps. Because of the elasticity, when closed, the plates apply a continuous squeezing force to the bag inserted in the sleeve, and the squeezing force is exercised until the infusion bag is empty. The SA Pressor can be used an estimated 1,000 times and has a minimum shelf life of 10 years when left in the unopened package.

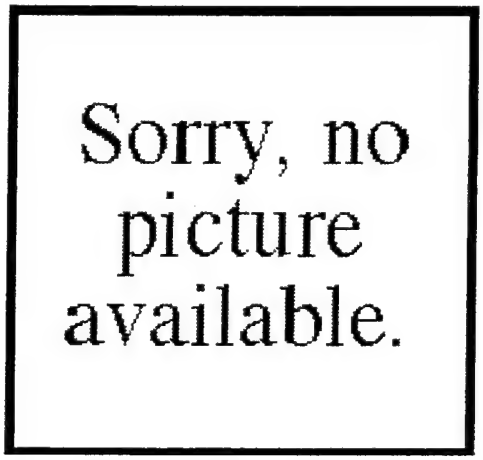
Sorry, no picture available.

**Power Requirements:** None

**Comments:** The care provider must monitor and adjust the drip rate as necessary if the SA Pressor is used for other than a maximum flow. The IV bag fluid level cannot be seen without close inspection. Manufacturer "Migada, Inc."

| UNACCEPTABLE | INFUSION |
|---|---|
| **DIAL-A-FLO DEVICE** | **Biomedical Systems Branch** |
| **Evaluation Date:** September 9 1976 | |

**Description:** File empty, unable to find any documentation.

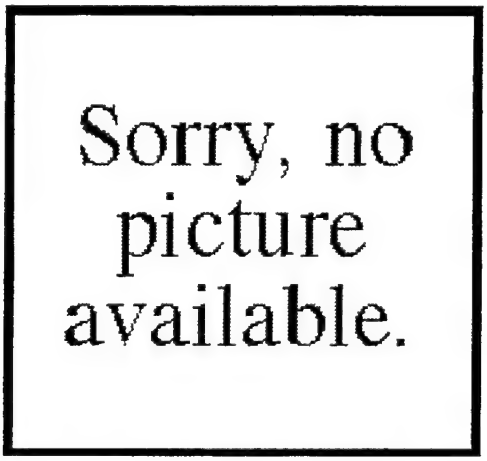



**Power Requirements:** None

**Comments:** Adversely affected by changes in altitude and solution head pressure.

| ACCEPTABLE | INFUSION |
|---|---|
| **EMERGENCY AND MILITARY INFUSION SYSTEM (EMIS)** | **Migada, Inc.**<br>**150 E. Olive Ave, Suite 215**<br>**Burbank, CA 91502**<br>**(818) 848-3880** |
| **Evaluation Date:** July 1 1988 | |

**Description:** Not available in record




**Power Requirements:** None

**Comments:** The dominant factor differentiating the EMIS set from the regular set is the design of the drip chamber which serves as a trap for air bubbles at the same time. The EMIS drip chamber is made of a rigid transparent material. This configuration ensures that after the chamber is partially filled with fluid, there is no contact between the outlet opening and the air bubble, in any possible position of the chamber. Thus the small amount of air left in the drip chamber enables monitoring of the flow when the drip chamber is held in the upright position, but the air does not escape into the circulatory system. The EMIS has a drop/volume ratio of 20 drops/ml and an accuracy of ±10%.

CONDITIONAL

**INFUSION**

# EXTRACORPOREAL INFUSION PUMP, MODELS 1203, 1211

**Extracorporeal Medical Specialties, Inc.**
**Royal & Ross**
**Kings of Prussia, PA 19406**
**(215) 337-2400**

**Evaluation Date:** June 1 1976

**Description:** The Extracorporeal Infusion Pump (1200 series) is designed for the administration of intravenous solutions. It is a roller type infusion pump with a variable speed 12 VDC 25 RPM motor which turns the rotor assembly. As the rotor assembly turns, the rollers occlude the silicone rubber pump chamber. Pumping action is achieved by alternately stretching and compressing the pump chamber. The Extracorporeal Infusion Pump (1200 series) has an integral empty bottle detector designed to be clamped on the IV tubing just below the drip chamber. The detector has a photoelectric cell which senses air passing through the portion of the IV tubing to which the detector is clamped. Audible and visual alarms are activated to warn of air in the tubing. Activation of the alarms automatically stops the pump until the problem is corrected.

Sorry, no picture available.

**Power Requirements:** 115 VAC 60 - 400 Hz or Self-contained rechargeable Ni-Cad battery.

**Comments:** The Extracorporeal Infusion Pump (1200 series) with integral empty bottle detector modified for EMI is acceptable for use onboard aeromedical airlift aircraft. In addition, the following modifications are strongly recommended to improve the safety and serviceability of the pump series:

1. Adaptation of empty bottle detector so that IV tubing remains horizontal to the detector with the bottom tubing wall resting against the bottom of the detector groove. This will ensure that all air bubbles will be detected.

2. Addition of dummy plug to allow pump to continue to operate should the detector become non-operational. It is not to be used to circumvent an operational detector.

3. Addition of signal light to warn detector not in use.

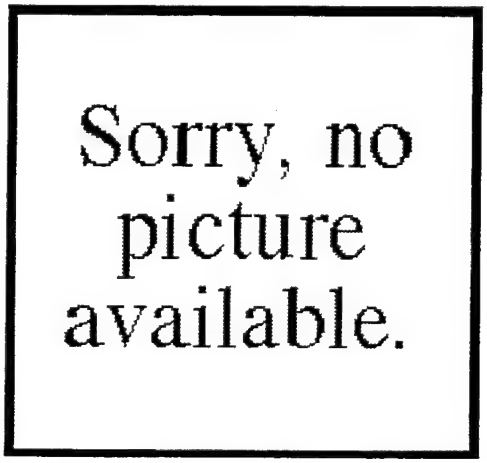
4. Addition of clip to secure empty bottle detector to pump housing for storage.

5. Fasten cable at detector housing so that detector cannot rotate about housing.

| ACCEPTABLE | INFUSION |
|---|---|
| **HARVARD APPARATUS MODEL 2720 SYRINGE INFUSION PUMP** | **Havard Apparatus**<br>**22 Pleasant Street**<br>**South Natick, MA 01760**<br>**(800) 343-4912** |

**Evaluation Date:** December 1 1981

**Description:** The Harvard Model 2720 Syringe Infusion Pump is a portable unit featuring microprocessor electronics which produce pulses to drive a stepping motor and lead screw at exact rates to empty syringes. The unit will accept either the 50 cm B-D Plastipak or the Monoject 60 cm plastic disposable syringes. Any flow rate from 0.1 to 99 cm/hr can be selected. Flow rates are accurate to ±3%.



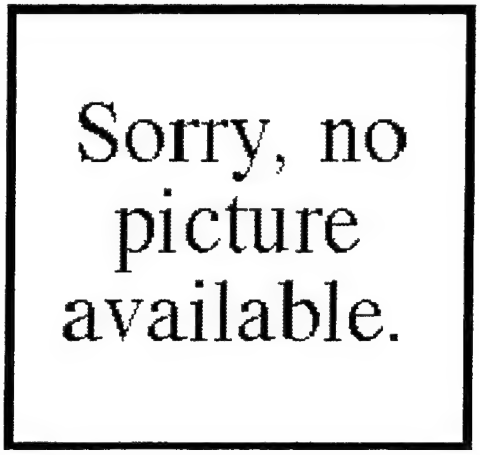

**Power Requirements:** 115 VAC 60 Hz (not tested on 400 Hz) or internal battery

**Comments:** Based on the test results the device is acceptable for use on board United States Air Force aeromedical evacuation aircraft.

| UNACCEPTABLE | INFUSION |
|---|---|
| **HARVARD COMPACT INFUSION PUMP, MODEL 975** | **Harvard Apparatus Company, Inc. 150 Dover Rd Millis, MA 02054 (617) 376-2987** |

**Evaluation Date:** September 4 1970

**Description:** Not available in record




**Power Requirements:** Not recorded

**Comments:** Based upon tests of this single unit, the Harvard Compact Infusion pump, Model 975, is unacceptable for routine use on United States Air Force Aeromedical Airlift. Testing of this item was terminated due to an apparent deficiency in the syringe holders. The interchangeable snap-in-plates which house syringe holders are provided for operation with 5 ml, 20 ml, 50 ml, and 100 ml standard syringes (glass or plastic). A U-shaped spring steel clip, coated with plastic, is used to hold the syringes. Clips on the plates supplied were too tight for the syringes and caused the unit to malfunction. Using 5 ml, 20 ml, and 50 ml plastic syringes, the clips caused the syringe walls to deform. This caused the plunger seal to break permitting fluid to discharge from the top of the syringes. One of the 5 ml plastic syringes cracked when placed in the clip. Using a 100 ml ground glass syringe, the clips caused the plunger to bind, stall and the motor to stop. Two Flight Nurses, reported that they had problems with the syringe holder clips in this type pump in that the clips became loose with use and caused operational difficulties. For the above reasons, the test and evaluations were terminated and the Harvard Compact Infusion Pump, Model 975, judged unacceptable.

CONDITIONAL

**INFUSION**

# HOLTER INFUSION PUMP, MODEL 903 & 911, CHARGER MODEL NO. RP 159

**Critikon, Inc.**
**P.O. Box 22800**
**Tampa, FL 33630**
**(800) 237-7541**

**Evaluation Date:** August 1 1973

**Description:** The Holter Infusion Pump is a Variable-speed motor coupled through a slip-clutch to the rotor assembly. Pumping action is achieved by stretch and compression as the rotor assembly turns and completely occludes the silicone-rubber pump chamber.

Sorry, no picture available.

**Power Requirements:** Holter Pump Power Supply/Charger will operate from 115 VAC 50 - 60 Hz or battery.

**Comments:** Based on tests conducted on one unit, the Holter Pump Power Supply/Charger unit meets all criteria required. From a clinical standpoint, the Holter pump should not be used without an air bubble detector with capabilities to shut off the pump at the first indication of air bubbles. Air may be pumped if the fluid container is allowed to empty or the pump chamber is torn or punctured. When using 115 VAC 400 Hz, power unit should not be operated near an electrically susceptible patient. Recommend using an air-line-detector

CONDITIONAL

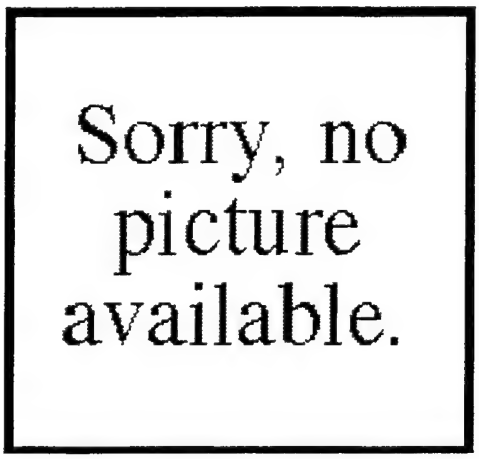
**INFUSION**

# IMED 922 VOLUMETRIC INFUSION PUMP ACCUSET DISPOSABLE CASSETTE

**IMED Corporation**
**9925 Carroll Canyon Rd**
**San Diego, CA 92131**
**(800) 854-2033**

**Evaluation Date:** May 1 1977

**Description:** Not available in record




**Power Requirements:** 110 VAC 50 - 400 Hz or internal sealed gel-cel Lead acid battery

**Comments:** The IMED 922 Volumetric Infusion Pump is conditionally acceptable for use. The air-in-line detector does not sense air bubbles 0.95 cm (3/8 inch) or smaller; therefore, a final inline air eliminator type filter should be used to outgas any air that passes the detector. On line power, the IMED exceeded the ground resistance limit by 10 milliohms; therefore, the pump should NOT be used on an electrically susceptible patient. However, it passed electromagnetic interference tests when operating on battery power, and can be used in the airborne environment. Due to the pump's height and weight, a special securing method will be required. A fully charged battery will operate for 40 hours at 125 ml/hr under ideal conditions. The low battery alarm will activate at 5.8 volts and the unit will continue to operate until it falls below 5.5 volts (approximately one hour). The manufacturer recommends battery replacement if, for any reason, battery voltage drops below 4-4.5 volts; however, normal battery life should be at least 2 years. New units are no longer available from the manufacturer.

CONDITIONAL

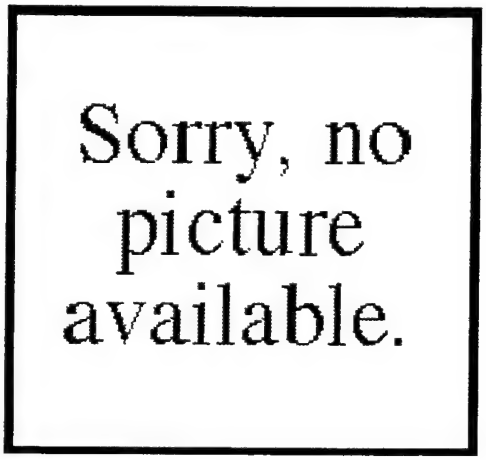
**INFUSION**

# IMED 928 VOLUMETRIC PUMP

**IMED Corporation**
**9925 Carroll Canyon Rd**
**San Diego, CA 92131**
**(800) 854-2033**

**Evaluation Date:** November 1 1983

**Description:** The IMED 928 Volumetric Infusion Pump is a high rate (0 - 799 ml/hr), all fluids detector, four-digit volume counter pump. The air-in-line detector does not sense air bubbles 0.95 cm (3/8 inch) or smaller; therefore, a final inline filter of the air eliminator type should be used to outgas any air that passes the detector. When a rate of 799 ml/hr is selected, rate accuracy is well within the ± 2% error factor. A full charged battery, without battery charger connected, will operate the pump at the selected rate of 799 ml/hr for a period of 5 to 6 hours; and will operate for 25 hours at 125 ml/hr under ideal conditions. Due to the pumps height and weight, a special securing method will be required. The manufacturer recommends battery replacement if the battery voltage drops below 4-4.5 volts; however, normal battery life should be at least 2 years. The low battery alarm will activate at 5.8 volts and the unit will continue to operate until it falls below 5.5 volts (approximately one hour).




**Power Requirements:** 110 VAC 60 Hz (not evaluated on 400 Hz) 1.2 amps or internal sealed gel-cel Lead acid battery

**Comments:** "Operate Only on Internal Batteries," Failed EMI testing on 60 Hz. New units are no longer available, refurbished only.

CONDITIONAL

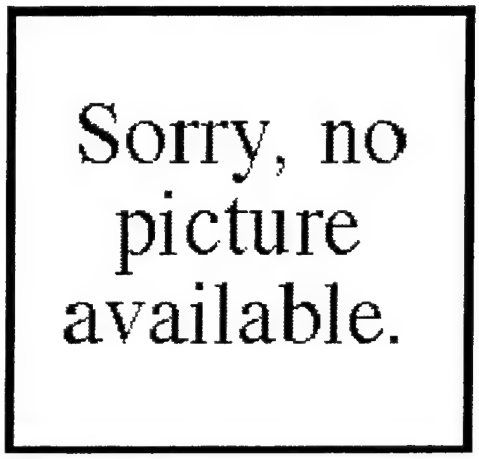
**INFUSION**

# IMED 960 VOLUMETRIC INFUSION PUMP

**IMED Corporation**
**9925 Carroll Canyon Rd**
**San Diego, CA 92131**
**(800) 854-2033**

**Evaluation Date:** April 1 1980

**Description:** The IMED 960 Volumetric Infusion Pump provides the capability to deliver a set volume per hour. The pump communicates operating conditions and alarm situations to the operator by a readout on the liquid crystal display (LCD) panel and also incorporates an audible alarm. Rates can be selected from one to 999 ml/hr and volume to be delivered can be selected from one to 999 ml. The pump incorporates an all-fluids embolism detector that will detect air bubbles in excess of 0.045 ml (1/4 inch) on the distal side of the cassette. The battery volume/capacity with the pump operating at 999 ml/hr is seven hours, at 125 ml/hr 17 hours, and at 50 ml/hr 24 hours.




**Power Requirements:** 120 VAC 60 Hz (not evaluated on 400 Hz) 0.5 amps or Internal rechargeable battery

**Comments:** Based on test results the device is acceptable for use in aeromedical evacuation aircraft and helicopters. Even tho, the air-in-line detector functioned in accordance with manufacturer's specifications, it is still recommended to add a final filter to outgas any air that might pass the air-in-line detector. New units are no longer available from the manufacturer; refurbished only.

| UNACCEPTABLE | INFUSION |
|---|---|
| **IV STAT CONSTANT PRESSURE INFUSER** | **I.V. STAT Corporation**<br>**P.O. Box 961**<br>**La Jolla, CA 92038**<br>**(619) 453-0668** |

**Evaluation Date:** July 7 1988

**Description:** The I.V. STAT is a self-contained, portable I.V. pump that generates a constant, safe pressure on flexible infusion bags to assure a steady flow rate. The source of its energy is a constant force spring that continuously exerts a predetermined pressure on the flexible bag, without adjustment, until it is completely empty.

Sorry, no picture available.

**Power Requirements:** None

**Comments:** The I.V. Stat is not recommended for use on aerovac flights mainly for safety reasons. The roller used to squeeze the I.V.. bag, automatically locks up and stops I.V. fluid administration if the device is tilted more than 10 degrees s on one end. There is no visual indication to show if the roller is released or locked-up. Edge of the roller is thin and could cut, if it were to accidentally fall on a patient or care provider. Other sharp corners on the device could also potentially injure patient or care provider. Found unacceptable.

| UNACCEPTABLE | INFUSION |
|---|---|
| **IVAC 400 AUTOMATIC SELF-REGULATING IV INFUSION PUMP** | **IVAC Corporation**<br>**P.O. Box 2385**<br>**La Jolla, CA 92037**<br>**(714) 453-4320** |

**Evaluation Date:** February 24 1970

**Description:** Not available in record

Sorry, no picture available.

**Power Requirements:** Not recorded

**Comments:** Based upon tests of this single unit, the IVAC Model 400 Automatic Self-Regulating IV Infusion Pump is not acceptable for routine use on USAF Aeromedical Airlift. Major modifications and improved quality control would be required to make this unit minimally acceptable. Those characteristics subject to objection include: 1) the unit provided for test was faulty and had to be repaired before the operational characteristics could be evaluated; 2) the unit pumped air from the drip chamber through the IV needle under environmental conditions commonly encountered in aeromedical evacuation; 3) the unit is not configured for convenient transport, handling, securing for operation, or to resist the adverse effects of shock and prolonged vibration. The electromagnetic radiation intensity from the pump is within the limits specified in MIL-STD-461A. Failed Rapid Decompression, Vibration, and Environmental Testing

# UNACCEPTABLE

**INFUSION**

## IVAC 500, AUTOMATIC SELF-REGULATING IV INFUSION PUMP, SERIAL NO. 1468

**IVAC Corporation**
**11353 Sorrento Valley Rd**
**San Diego, CA 92121**
**(714) 453-4320**

**Evaluation Date:** July 18 1972

**Description:** The IVAC AUTOMATIC SELF-REGULATING IV INFUSION PUMP, Model 500, uses a photo-electric sensor to monitor every drop as it passes through the drip chamber. Any change in the drop rate is detected by the sensor which automatically adjusts the pump to maintain the preset flow. The device provides a selection of drop rate ranges from 1 to 99 dpm. When the bottle containing the solution runs out of liquid, or if for any reason the selected infusion rate cannot be maintained, the device will activate the alarm and stop the pump. The alarm is visual and/or audible depending on desired setting.

Sorry, no picture available.

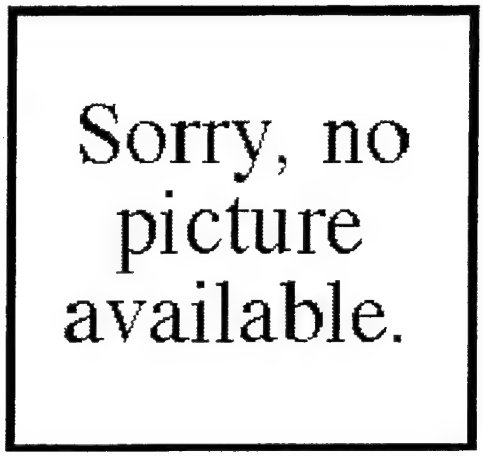
**Power Requirements:** 90 - 130 VAC/55 - 65 Hz

**Comments:** Failed EMI and Altitude testing.

| UNACCEPTABLE | INFUSION |
|---|---|
| **MINIMED III INFUSION SYSTEM** | **MiniMed Technologies**<br>**12744 San Fernando Rd**<br>**Slymar, CA 91342**<br>**(818) 362-6822** |

**Evaluation Date:** March 1 1991

**Description:** The MiniMed III is a multi-channel, programmable fluid delivery system. It performs the functions of three independent pumps, and because of its size and weight is less than one quarter that of a standard single channel IV pump. it can deliver a variety of fluids and can be used for intravenous, intra-arterial and subcutaneous applications. Complete alarm systems, both pump channel specific and whole instrument, are incorporated into the MiniMed III so that its operation is safe and easy.




**Power Requirements:** 110 VAC or Internal battery

**Comments:** Failed EMI testing.

CONDITIONAL

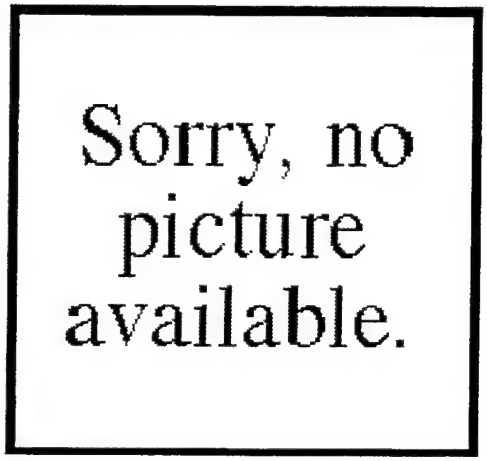
# INFUSION

## MTP MODEL 1001a INFUSION PUMP

**Medical Technology Products, Inc.**
**107 Woodbury Rd**
**Huntington, NY 11743**
**(516) 549-4350**

**Evaluation Date:** April 1 1990

**Description:** The Model 1001a is programmed to deliver IV solutions and blood at flow rates from 0.1 ml to 499.9 ml, and to deliver a preset volume from 1 to 999 ml, while reporting the volume delivered up to 9999 ml. Visual and audible alarms include air in line, occlusion, low battery, and tampering. The internal battery is charged by the power transformer. When connected to a power supply by the transformer, the battery is being charged, whether in use or not. Also, when connected to a power supply, the unit is operable regardless of battery condition.



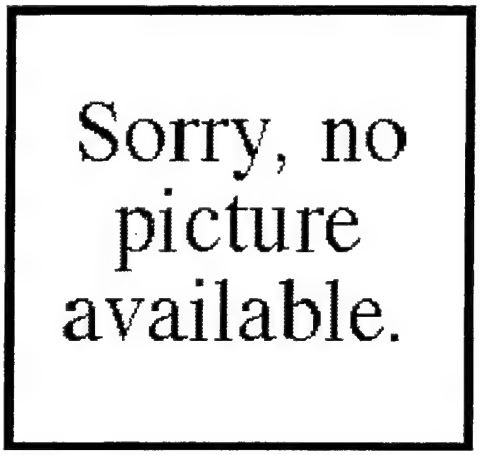

**Power Requirements:** 110 - 115 VAC 50 - 400 Hz, 0.03 amps or rechargeable sealed gel-cel battery 6 VDC

**Comments:** The model 1001a requires extensive modification for electromagnetic interference. The Model 1001a must be supplied with the PS6100 battery, which satisfies electromagnetic interference, vibrational, and duration requirements. The bracket securing the internal battery must be reinforced by the manufacturer. Only MTP Model 1200 tubing should be used. The battery takes 24 hours to fully charge. When fully charged, it will power the Model 1001a for approximately 30 hours. Using any tubing other than MTP Model 1200 could result in leakage, inaccurate delivery rates, and other problems.

| ACCEPTABLE | INFUSION |
|---|---|
| **SAM INFUSION PUMP BUBBLE DETECTOR WITH HOLTER INFUSION PUMP** | **Manufacturer Unknown** |

**Evaluation Date:** May 5 1975

**Description:** The School of Aerospace Medicine infusion pump babble detector is a solid state photoelectric sensor which detects air bubbles in the intravenous (IV) administration set tubing. Upon detecting an air bubble in the tubing the detector shuts off the infusion pump. The detector photosensor, light source, and pump shut off circuitry is housed in a 1 1/4" wide, 1" high, 3/4" deep anodized machined aluminum case. The sensor housing contains a small red light which turns on when the pump is shut off by the detector, and a normally closed push button switch which is used to reactivate the pump. The detector housing has two phone plugs which are used to plug the sensor into the modified housing of a Holter Model 903 or 911 infusion pump. Power for the sensor is obtained from the Holter pump battery supply. The detector housing has a groove that will accommodate the Holter administration set tubing. A small hinged lid holds the IV tubing in the groove. The infrared light emitting diode (LED) is installed on one side of the groove and the infrared photodetector is located on the other side of the groove with the IV tubing in between.




**Power Requirements:** 115 VAC 60 - 400 Hz or internal battery

**Comments:** Results of test on the bubble detector in conjunction with the Holter infusion pump, model 903 and 911, may be used on board United States Air Force aeromedical evacuation aircraft.

| UNACCEPTABLE | INFUSION |
|---|---|
| **SIGMAMOTOR TM-20-2 INFUSION PUMP** | **Sigmamotor , Inc.**<br>**14 Elizabeth Street**<br>**Middleport, NY 14105**<br>**(716) 735-3616** |

**Evaluation Date:** July 3 1970

**Description:** Not available in record

Sorry, no picture available.

**Power Requirements:** 110 VAC 60-400 Hz (Not tested on 400 Hz)

**Comments:** Failed EMI testing. Based upon tests of a single unit, The Sigmamotor TM-20-2 Infusion Pump is unacceptable for routine use on USAF Aeromedical Airlift. Modifications would be required to make this unit acceptable. Those characteristics subject to objection include: 1) the unit is not configured for convenient transport handling, securing for operation, and to resist the adverse effects of shock and prolonged vibration; 2) the low voltage rating of the 100 uf electrolytic capacitor in the rectifier circuit; and 3) the electromagnetic radiation intensity from the pump exceeds the limits specified in MIL-STD-461A.

# UNACCEPTABLE

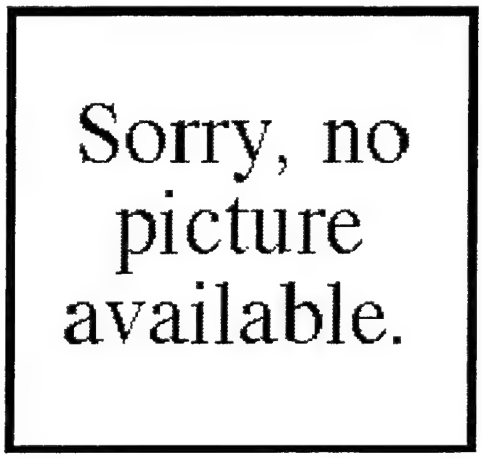
**INFUSION**

## SIGMAMOTOR VOLUMET INFUSION PUMP

**Sigmamotor, Inc.**
**14 Elizabeth Street**
**Middleport, NY 14105**
**(716) 735-3616**

**Evaluation Date:** May 1 1977

**Description:** The Sigmamotor Volumet infusion pump uses a peristaltic pump acting on a calibrated IV tubing administration set to provide volumetric accuracy. There are no valves, moving parts, or connections in contact with the fluid. It has a pushbutton-set digital rate of 1 - 499 cc/hr. In addition, there is a light-emitting diode digital totalizer that shows total volume delivered. Normal operation is from a 120 VAC, 60 Hz power source with an internal battery that will supply power to the unit for approximately 2 hours. The rechargeable Ni-Cad battery unit is intended for emergency or normal transport use only. The unit has an Air/Detect alarm light and buzzer which automatically drops the rate to 1 cc/hr should an air bubble be detected. It senses air bubbles 1/16th inch or larger. The power on light indicates whether the unit is operating from AC or battery power. The pump/alarm light shows white on top to indicate pump on and red on bottom to indicate an alarm condition. The accuracy of the volume delivered is ±6%.




**Power Requirements:** 120 VAC 60 Hz or Ni-Cad battery pack

**Comments:** Failed EMI testing.

| UNACCEPTABLE | INFUSION |
|---|---|
| **TRAVENOL FLO-GARD 6000 VOLUMETRIC INFUSION PUMP** | **Travenol Laboratories Deerfield, IL 60015** |

**Evaluation Date:** April 19 1983

**Description:** The unit is an electromechanical device used for the intravenous infusion of liquids at constant rates.

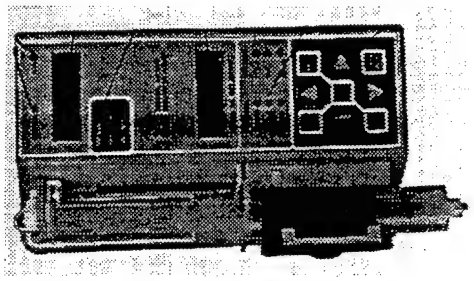
Sorry, no picture available.

**Power Requirements:** 115 VAC, 60 Hz or internal rechargeable battery

**Comments:** Failed EMI testing.

| ACCEPTABLE | INFUSION |
|---|---|
| **TRAVENOL INFUSION PUMP, MODEL AS20S** | **Baxter Healthcare Corp<br>(Autosyringe Division)<br>198 Londonderry Turnpike<br>Hooksett, NH 03106<br>(800) 258-3591** |
| **Evaluation Date:** April 1 1990 | |

**Description:** The Model AS20S was evaluated as a component of the International Biomedical Neonatal Transport System. It is an autosyringe that accepts any size Plastipak (B-D) or Monoject syringe from 1 to 60 ml.



**Power Requirements:** 105 - 125 VAC 60 Hz, 0.03 amp or internal Ni-Cad battery

**Comments:** The AS20S may be used independently of, or as part of, the Neonatal Transport System. Some models of the AS20S are wired to accommodate international voltages. Since these units have not been tested for electromagnetic interference using those voltages, they are not recommended for aeromedical use.

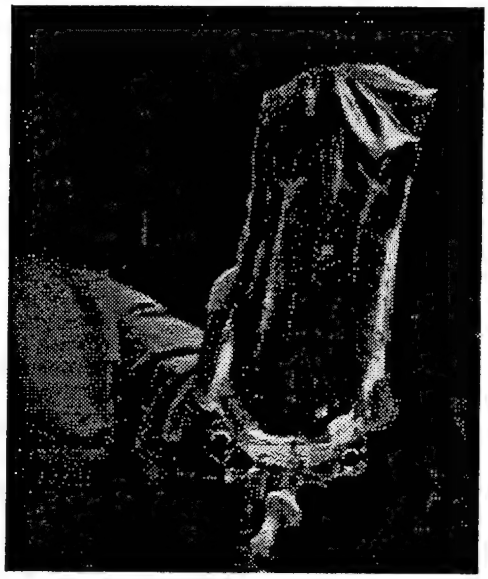
CONDITIONAL

**INFUSION**

# VIAFLEX PLASTIC IV CONTAINERS

**Travenol Laboratories, Inc.**
**Morton Gove, IL 60053**
**(800) 492-9800**

**Evaluation Date:** March 1 1973



**Description:** Not available in record

**Power Requirements:** None

**Comments:** Inflight testing indicated that seed bubbles form sporadically in both the container and administration line. These bubbles tend to adhere to the walls of the container and line. Cause of formation was not determined. However, the system should be carefully observed inflight due to the sporadic formation of bubbles. An inline filter should be used to negate the problem of seed bubbles during aeromedical evacuation missions.

# AEROMEDICAL RESEARCH STATUS GUIDE

## MISCELLANEOUS

- ABBOTT CLOSED URINARY DRAINAGE SYSTEM
- ANTISHOCK TROUSERS
- BIOLOGICAL AEROSOL MONITOR
- COMPUR M 1000 MINI-PHOTOMETER
- COMPUR M 1100 MINI-CENTRIFUGE
- CURITY MONOFLO DRAINAGE BAG
- DEPUY CAST-O-VAC CAST CUTTER, MODEL 1049
- DEXTROMETER REFLECTANCE COLORIMETER
- DISPOSABLE ASHTRAY
- DOVER URINARY DRAINAGE BAG WITH FLO-CHECK VALVE
- DYNACOR CLOSED URINARY DRAINAGE SYSTEM
- EXTRACORPOREAL MEMBRANE OXYGENATION SYSTEM (ECMO)
- FRENCH VACUUM IMMOBILIZER LITTER
- GORMAN-RUPP PATIENT THERMOREGULATOR, MODEL RK 250
- HARDWIRED COMMUNICATION SYSTEM (40 AES)
- HARDWIRED HEADSET, SOMMERKAMP PROTOTYPE (69 AES)
- IVAC DIGITAL ELECTRONIC THERMOMETER WITH EMI SUPPRESSION CASE, MODEL 810
- LITTER ACCESS DEVICE
- LITTER BACK RESTS
- LITTER ENPLANING - DEPLANING DEVICE (LEDD)
- LITTER LINEN LIFT
- LITTER MOUNTED EXAMINATION LAMP
- MEDICAL TREATMENT CHEST
- MODESTY CURTAIN, DISPOSABLE
- MODIFIED STOKES LITTER
- NELKIN/PIPER DIGITAL THERMOMETER, MODEL 268
- NELKIN/PIPER DIGITAL THERMOMETER, MODEL 270
- REDI-TEMP HEAT/COLD THERAPY SYSTEM
- REMIC HEADSET COMMUNICATION SYSTEM, MODEL 7800H
- REMINGTON ELECTRIC SHAVER ELECTRO SHAVE 6
- RF NURSE CALL SYSTEM - MEDICALL
- SEPTISOL FOAM (4.6 OZ) DISPENSER MOUNT
- STERITEMP DIGITAL THERMOMETER, MODEL MT-500-1
- STRYKER CAST CUTTER PLASTER VAC, MODEL 845"

- STRYKER WEDGE TURNING FRAME, MODEL 124
- TAKEDA MEDICAL DIGITAL THERMOMETER, MODEL UF - 10
- TEMPA-DOT SINGLE USE ORAL THERMOMETER
- THOMPSON CARRIER LITTER
- TRANSPORTABLE AIRBORNE THERAPEUTIC STATION (TATS)
- TRAVENOL CYSTOFLO II CLOSED URINARY DRAINAGE SYSTEM
- UNI-TEMP SINGLE USE THERMOMETER
- VALLEYLAB FORCE 1B ELECTROSURGICAL GENERATOR
- VICKERS AIRCRAFT TRANSIT ISOLATOR

CONDITIONAL

**MISCELLANEOUS**

# ABBOTT CLOSED URINARY DRAINAGE SYSTEM

**Abbott Laboratories**
**Abbott Park**
**North Chicago, IL 60064**
**(312) 688-7850**

**Evaluation Date:** June 1 1979

**Description:** The Abbott drainage bag - 2000 is a disposable urinary bag. It provides a closed system for the collection and measurement of urinary output.

Sorry, no picture available.

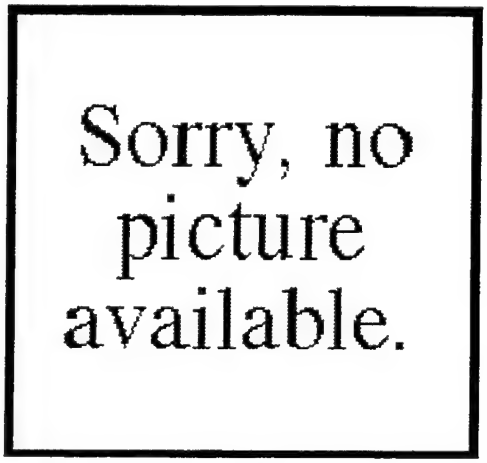
**Power Requirements:** None

**Comments:** Failed Rapid Decompression testing and is not acceptable for United States Air Force aeromedical evacuation aircraft. The device is acceptable for use "ONLY" on Air Rescue & Recovery Service helicopters without an additional means of venting.

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **ANTISHOCK TROUSERS** | **Manufacturer Unknown** |

**Evaluation Date:** September 7 1976

**Description:** The Military AntiShock Trousers is an immediate, rapid treatment for use by medical and paramedical personnel in the treatment of the hypovolemic shock patient. The hypovolemic condition is usually produced by trauma, but other etiologies such as intra-abdominal bleeding or vaginal hemorrhage are considered indications. The Military AntiShock Trousers also acts as a lower body and extremity air splint in the case of fractures to assist in stabilization, relief of pain and prevention of further neurovascular damage.

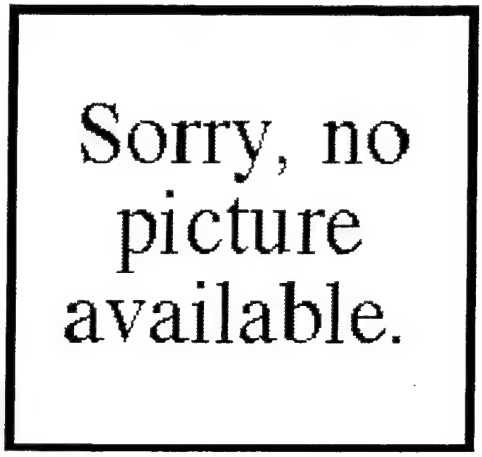



**Power Requirements:** None

**Comments:** Tested by United States Army Aeromedical Research Laboratory and accepted for us by United States Air Force.

| UNACCEPTABLE | MISCELLANEOUS |
|---|---|
| **BIOLOGICAL AEROSOL MONITOR** | **Manufacturer Unknown** |
| **Evaluation Date:** April 22 1991 | |

**Description:** The Biological Aerosol Monitor (BAM) is designed to detect concentrations of foreign chemicals in the air. It provides a digital readout of the concentration in parts per million. Through the window a digital display may be read. The BAM is powered by a power sonic sealed rechargeable battery. The BAM can be set to cycle at 0.5, 1, 2, 5, and 10 minute sampling rates. The unit has a visual alarm with an adjustable alarm level. A pressure release valve is located on the front side of the unit to allow a manual release of any vacuum seal that may be created in the unit. There are two female receptacles with caps located on the front side of the unit. One port is the air intake used for sampling, and the other is the exhaust port. There is a receptacle for the external battery.




**Power Requirements:** Battery

**Comments:** Failed EMI testing.

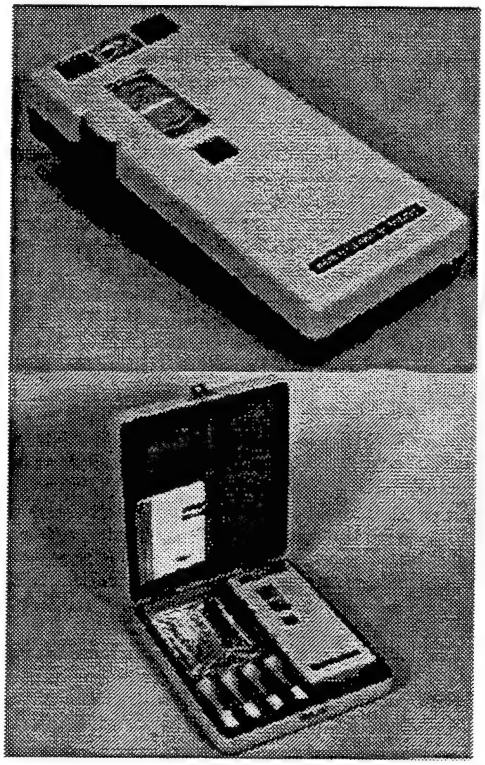
# ACCEPTABLE

## MISCELLANEOUS

## COMPUR M 1000 MINI-PHOTOMETER

**Ames Division**
**Miles Laboratories, Inc.**
**P.O. Box 70**
**Elkhart, IN 46515**
**(219) 264-8645 & (800) 248-2637**

**Evaluation Date:** June 1 1981



**Description:** The Compur M 1000 Mini-Photometer is a hand-size, lightweight photometer, designed for hemoglobin determinations and erythrocyte counts.

**Power Requirements:** Five (5) AA size batteries.

**Comments:** The Mini-Photometer is acceptable for use in aeromedical evacuation aircraft and Air Rescue & Recovery Services helicopters.

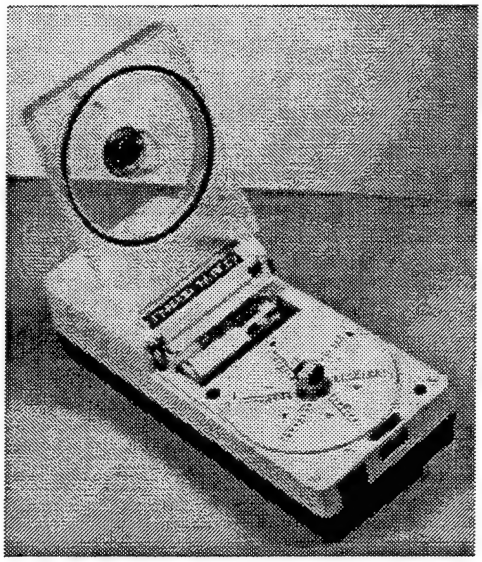
# ACCEPTABLE

## MISCELLANEOUS

## COMPUR M 1100 MINI-CENTRIFUGE

**Ames Division**
**Miles Laboratories, Inc.**
**(Diagnostic Division)**
**P.O. Box 70**
**Elkhart, IN 46515**
**(219) 264-8645 & (800) 248-2637**

**Evaluation Date:** June 1 1981



**Description:** Compur M 1100 Mini-Centrifuge is a hand-size, lightweight centrifuge; designed to give accurate hematocrit readings. It can also be used for plasma extraction.

**Power Requirements:** Six C-size alkaline batteries.

**Comments:** The AMES COMPUR M 1100 Mini-Centrifuge is acceptable for use in aeromedical evacuation aircraft and Air Rescue & Recovery Service helicopters.

# ACCEPTABLE

## MISCELLANEOUS

## CURITY MONOFLO DRAINAGE BAG CURITY URINE METER WITH ASPIRATING PORT

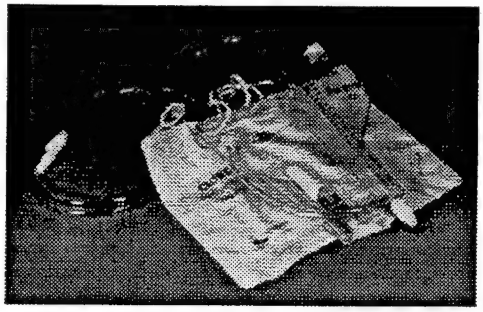
**Kendall Company**
**(Hospital Products Division)**
**1 Federal Street**
**Boston, MA 02110**
**(617) 423-2000**

**Evaluation Date:** June 1 1979

**Description:** Below is a brief synopsis of items tested.

A. The Curity Monoflo drainage bag is a disposable urinary drainage bag. It provides a closed system for the collection and measurement of urinary output.

B. The Curity Urine Meter with aspirating port is a disposable urine collection bag with a preconnected urine meter and drainage tubing. It provides a closed system for the collection and measurement of urine output. The integral urine meter provides the capability of measuring very small urine outputs from as little as 4 ml.



**Power Requirements:** None

**Comments:** Based on the results of the tests conducted, both units are acceptable for use onboard aeromedical evacuation aircraft and Air Rescue Recovery Service helicopters. In the event of an extremely rapid decompression (1 sec or less), the momentary high positive pressure in the system might cause reflux to the bladder.

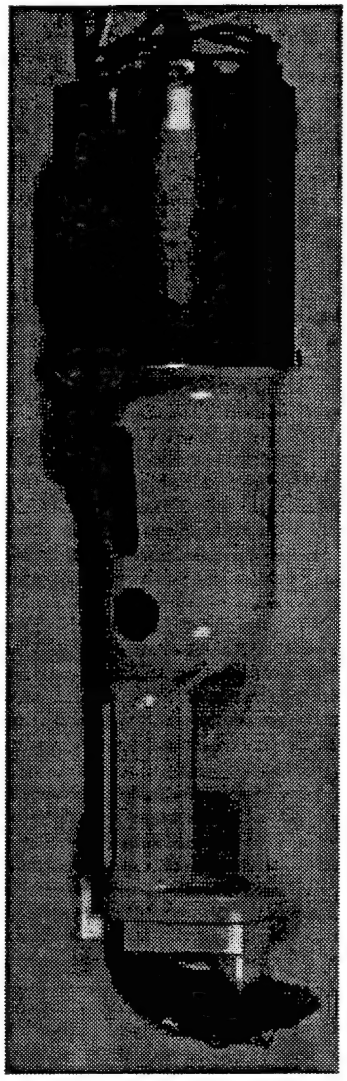
# UNACCEPTABLE

## MISCELLANEOUS

## DEPUY CAST-O-VAC CAST CUTTER, MODEL 1049

**DePuy Manufacturing Co., Inc.**
**Warsaw, IN**

**Evaluation Date:** April 1 1972



**Description:** The DePuy Cast-O-Vac cast cutter is 12 inches long and weighs 4 pounds 3 ounces. An integral blower collects the plaster dust and retains it in a reusable cloth bag.

**Power Requirements:** 110 VAC 60 Hz

**Comments:** Failed EMI testing.

# ACCEPTABLE

## MISCELLANEOUS

## DEXTROMETER REFLECTANCE COLORIMETER

**Ames Division**
**Miles Laboratories, Inc.**
**P.O. Box 70**
**Elkhart, IN 46515**
**(219) 264-8645 & (800) 248-2637**

**Evaluation Date:** July 1 1981

**Description:** The Dextrometer Reflectance Colorimeter measures the degrees of color developed on a Dextrostix Reagent Strip by the glucose contained in a drop of whole blood. The amount of light reflected from the reacted reagent area of Dextrostix is measured electronically, and a direct readout of the blood glucose value is displayed on the digital display.

Sorry, no picture available.

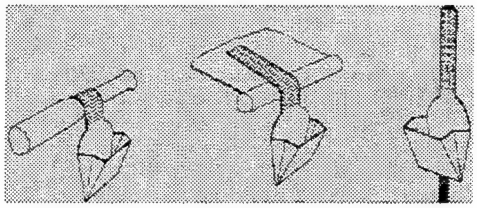
**Power Requirements:** 110 VAC 50 - 60 Hz (not tested on 400 Hz) or Battery

**Comments:** The Dextrometer Reflectance Colorimeter is approved for aeromedical evacuation aircraft and helicopters.

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **DISPOSABLE ASHTRAY** | **Container Corporation of America**<br>**P.O. Box 1007, 925 Ave. H East**<br>**Arlington, TX 76010**<br>**(817) 649-3341** |

**Evaluation Date:** July 1 1973

**Description:** The newly developed disposable ashtray is an expandable, foil-lined bellows cup made from fire retardant material. The ashtray has a handle 6 inches in length that is scored at 1/4 inch intervals to make it flexible for application to a round litter pole. The handle has a protected adhesive backing which adheres to canvas , wood, or metal.



**Power Requirements:** None

**Comments:** Device is acceptable as designed.

# ACCEPTABLE

## MISCELLANEOUS

# DOVER URINARY DRAINAGE BAG WITH FLO-CHECK VALVE DOVER URINARY DRAINAGE BAG WITH URINE METER

**Will Ross Inc.**
**Dover Urology Products**
**11500 S. Main, Suite 126**
**Houston, TX 77025**
**(512) 661-2341 & (713) 667-2907**

**Evaluation Date:** June 1 1979

**Description:** The Dover urinary drainage bag is a disposable urinary drainage bag with a sample port and a Flo-Check anti-reflux valve. It provides a closed system for the collection and measurement of urinary output. The anti-reflux valve is provided to prevent urine from returning to the bladder should the bag be placed on the same level as the bladder. The Dover drainage bag with urine meter and sample port is a disposable urine collection bag with a preconnected urine meter and drainage tubing. It provides a closed system for the collection and measurement of urinary output. The integral urine meter provides the capability of measuring very small urine outputs from as little as 2 ml to 200 ml.

**Power Requirements:** None

**Comments:** Based on the results of the tests conducted, both the Dover drainage bag with flo-check valve and the Dover drainage bag with urine meter can be considered acceptable for use onboard aeromedical evacuation aircraft and Air Rescue Recovery Service helicopters. In the event of an extremely rapid decompression (1 sec or less), the momentary high positive pressure in the system might cause reflux to the bladder.

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **DYNACOR CLOSED URINARY DRAINAGE SYSTEM** | **Manufacturer Unknown** |

**Evaluation Date:** June 1 1979

**Description:** The Dynacor unit is a disposable urinary drainage bag. It provides a closed system for the collection and measurement of urinary output.

**Power Requirements:** None

**Comments:** Based on the results of the tests conducted, the Dynacor closed urinary drainage system can be considered acceptable for use onboard aeromedical evacuation aircraft and Air Rescue Recovery Service Helicopters. In the event of an extremely rapid decompression (1 sec or less), the momentary high positive pressure in the system might cause reflux to the bladder.

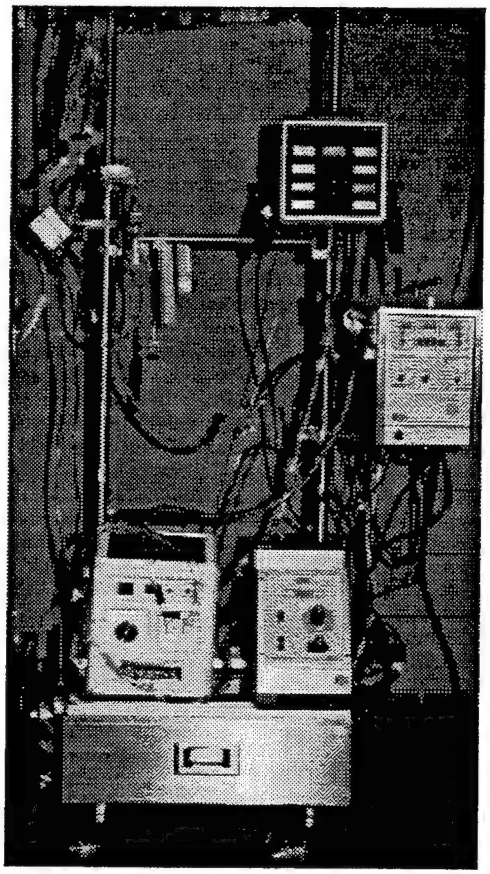
CONDITIONAL

**MISCELLANEOUS**

# EXTRACORPOREAL MEMBRANE OXYGENATION SYSTEM (ECMO)

**For Manufacturer's Address call Aeromedical Research**

**Evaluation Date:** January 1 1987



**Description:** The Aerovac Extracorporeal Oxygenation System (ECMO) is a transportable heart-lung bypass device used in the treatment of neonate and infant respiratory failure. It was designed for use by the Wilford Hall Medical Center, Lackland Air Force Base TX, Neonatal Intensive Care Unit, ECMO Transport Team; and consists of many specialized health devices, support equipment, and medical supplies from several manufacturers. Major components and Power Requirements are listed here:

**Comments:** As of the Evaluation Completed, Wilford Hall Medical Center was the only United States Air Force medical treatment facility that provides ECMO services. Acceptable for use on the C-9A aircraft only. Aeromedical Evacuation Crew Member's will not operate the system. Users from the medical treatment facility must have received inflight training with the ECMO system, and understand the environmental factors involved. In-line air filters must be used to trap air bubbles formed at altitude.

# EXTRACORPOREAL MEMBRANE OXYGENATION SYSTEM (ECMO)

## MAJOR COMPONENTS OF ECMO

| COMPONENT | MANUFACTURER | FUNCTION | POWER REQUIREMENTS |
|---|---|---|---|
| Blood Pump | Local fabrication | Regulates blood flow<br>Holds venous reservoir | 115 VAC/60Hz, 4mA (only during reservoir activation) |
| Blood Pump Regulator | Sarns S10K | Pumps blood through system | 95-125 VAC 50-60Hz, .4A |
| Temperature Therapy Pump | Gaymar TP-200 | Circulates heated water to warm blood | 115 VAC/60Hz, 2A |
| (UPS) Uninterrupted Power Source | Topaz 84126-01 | Provides continuous 120VAC/60 Hz | 102-132 VAC/60Hz Internal Batteries, Two 12V, 28Ah gel celled, lead acid |
| Venous Reservoir | Model RV-500-1 | Receives blood, traps air | N/A |
| Membrane | SciMed 0800-2A Oxygenator | Artificial lung membrane | N/A |
| ECMO Cart | Local fabrication | Provides equipment set-up and mobility | N/A |

## DIMENSIONS OF ECMO COMPONENTS

| | |
|---|---|
| ECMO CART | 14"(H) x 24"(W) x 40"(L) |
| ECMO Boxes (2 each) | 17"(H) x 17"(W) x 19"(L) |
| Transport Boxes (2 each) | 16"(H) x 16"(W) x 21"(L) |
| Support Equipment | 18"(H) x 18"(W) x 24"(L) |
| Topaz UPS | 15"(H) x 7"(W) x 24"(L) |
| Assembled Ecmo (with incubator and NATO litter) | 48"(H) x 40"(W) x 90"(L) |

**The system weighs approximately 200 pounds assembled, and 300 pounds crated.**

CONDITIONAL

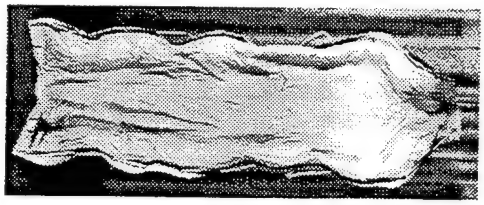
MISCELLANEOUS

# FRENCH VACUUM IMMOBILIZER LITTER

**Coquille International**
**35, rue du Marechal De Lattre de Tassigny**
**P.O. Box Nr 3**
**Erstein, France 67150**

**Evaluation Date:** March 1 1983

**Description:** The Vacuum Immobilizer consists of an air-tight envelope containing plastic balls. On evacuation of the air, it becomes a lightweight rigid structure for the immobilization and transportation of an injured patient.



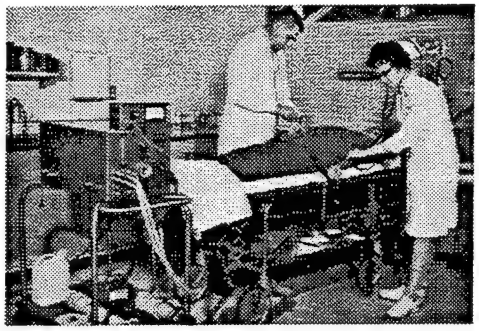
**Power Requirements:** None

**Comments:** Caution - the internal pressure/rigidity of the unit must be frequently monitored. The Immobilizer will tend to soften with altitude, but the rigidity is easily adjusted by evacuating more air during ascent. The Immobilizer must be secured on a standard NATO Litter. Recommended for added patient safety is the addition of an in-line vacuum gauge to monitor the internal pressure of the Immobilizer. Without an in-line gauge, the Immobilizer feels rigid with as little as 100-200 mmHg; therefore, the mattress could start losing rigidity at an altitude of 4,000 feet, if 100 mmHg is drawn off.

**NOT ACCEPTABLE FOR USE ONBOARD FIXED-WING AIRCRAFT BUT CAN BE CONSIDERED ACCEPTABLE FOR USE ONBOARD ROTARY-TYPE AIRCRAFT.**

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **GORMAN-RUPP PATIENT THERMOREGULATOR, MODEL RK 250** | **Gorman-Rupp Industries Division**<br>**Bellville, OH 44813** |
| **Evaluation Date:** April 1 1976 | |

**Description:** The Patient Thermoregulator set consists of a heating/cooling unit Model RK 250, a pad or pads, and an auxiliary electronic control, Model EC 250. The Model RK 250 may be used separately with pad (s) to manually control patient's body temperature, or in conjunction with the electronic control, to automatically control body temperature; the temperature is sensed by a thermistor probe whose output is then displayed on an electronic thermometer and also used to control the temperature to an accuracy of ±0.2 degrees F (±0.11 degrees C) at 98.6 degrees F (37 degrees C). Separate safety over and under temperature thermostat controls prevent fluid temperatures under 40 degrees F (4.4 degrees C) or over 105 degrees F (41 degrees C); operation of these vices s indicated by appropriately labeled indicating lamps. The thermoregulator set controls body temperature by circulating heated or cooled fluid through pads containing serpentine fluid passages. The pads are placed over, under and around the patient as required to provide the required heat transfer. Four set of quick-disconnect pad connections allow the use of four pads simultaneously.



**Power Requirements:** 115 VAC 60 Hz only.

**Comments:** Did not meet radiated and conducted EMI requirements. Waiver granted by ASC/ENACE, Wright-Patterson AFB, Ohio. Must notify aircraft commander when in use.

| UNACCEPTABLE | MISCELLANEOUS |
|---|---|
| **HARDWIRED COMMUNICATION SYSTEM (40 AES)** | **40 AES** |

**Evaluation Date:** November 4 1987

**Description:** The 40 AES communication devices requires two A.F. headsets be plugged into a box containing a "Push to Talk" audio amplifier.

Sorry, no picture available.

**Power Requirements:** 9 Volt Battery

**Comments:** Failed EMI testing when unit was turned on & off, also when unit push to talk button was depressed. This device is a "homemade" piece of equipment, and is of minimum quality and workmanship.

| UNACCEPTABLE | MISCELLANEOUS |
|---|---|
| **HARDWIRED HEADSET, SOMMERKAMP PROTOTYPE (69 AES)** | **69 AES** |

**Evaluation Date:** November 4 1987

**Description:** The 69 AES communication devices requires two headsets be plugged into a box containing a "Push to Talk" audio amplifier.

Sorry, no picture available.

**Power Requirements:** 9 Volt Battery

**Comments:** The device was EMI evaluated only. It passed the normal requirements for EMI testing, but failed when it was turned on or off, and when it was keyed (button depressed for talking, released for listening.)

CONDITIONAL

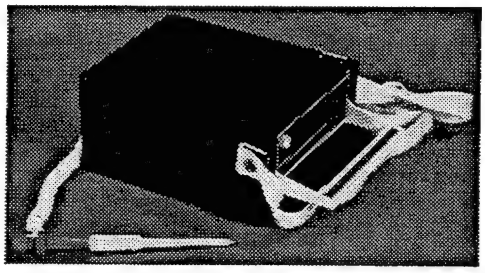
# MISCELLANEOUS

# IVAC DIGITAL ELECTRONIC THERMOMETER WITH EMI SUPPRESSION CASE, MODEL 810

IVAC Corporation
11353 Sorrento Valley Rd
San Diego, CA 92121
(713) 453-4320

**Evaluation Date:** July 1 1973

**Description:** The IVAC Electronic Thermometer is a lightweight, completely portable unit powered by a rechargeable battery. The IVAC battery charger doubles as a storage stand when the thermometer is not in use and assures a fully charged battery at all times. Two basic methods of taking temperature with the IVAC thermometer are computed mode and extended mode. In the computed mode, the Model 810 utilizes circuitry to measure the rate of temperature change and compute the estimated body temperature in approximately 15 seconds. The temperature is displayed to the nearest one-tenth of a degrees Fahrenheit, and at the same time a red light comes on, to the right of the temperature reading, indicating completion of computing. In the extended mode, the temperature displayed is not recorded until the reading stabilizes. It requires on to two minutes for the temperature reading to stabilize. Disposable probe covers are used to prevent cross contamination.



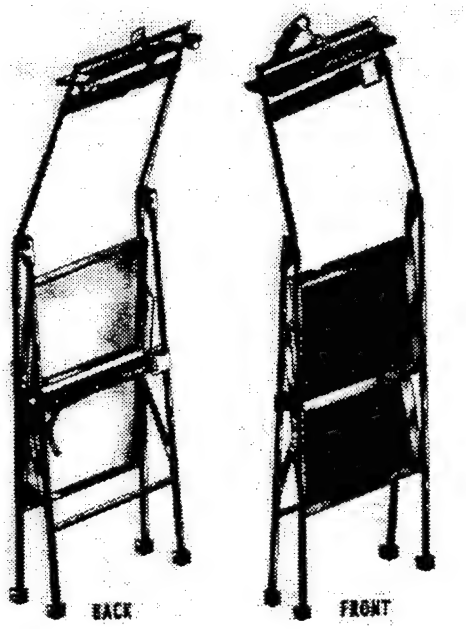
**Power Requirements:** Thermometer - Battery operation / Battery charger - 115 VAC 45 - 450 Hz

**Comments:** The thermometer did not pass EMI testing; however, with the thermometer in the aluminum case, the thermometers were approved for aeromedical evacuation.

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **LITTER ACCESS DEVICE** | **Contract** |

**Evaluation Date:** June 1 1973

**Description:** The Litter access device is a logistically and operationally acceptable device which enables aeromedical personnel to have safe access to patients in upper litter spaces and permits able litter patients to ascend and descend safely from upper litters.

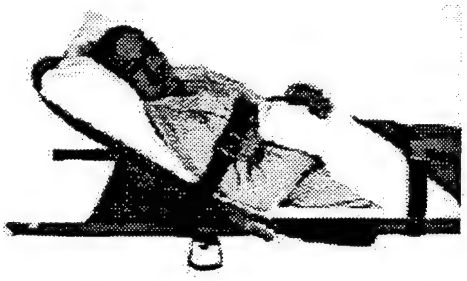



**Power Requirements:** None

**Comments:** Engineering drawings for the C-141 litter access device are on file at the Engineering Data Center, 2750 ABW/EDDR, Wright-Patterson AFB, Ohio. The drawing number and nomenclature are: No. 731817 - Assembly of Litter Access Device

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **LITTER BACK RESTS** | **Manufacturer Unknown** |
| **Evaluation Date:** March 1 1970 | |

**Description:** A "U" shape devices made of tubular aluminum frame with a canvas cover and incorporates dual position clamps that attaches to NATO litters providing patient elevations of 30 degrees & 90 degrees .



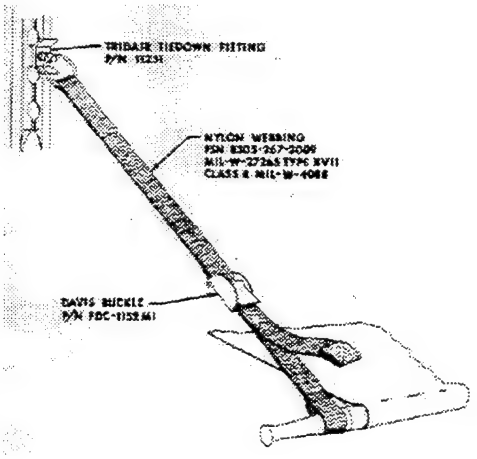
**Power Requirements:** None

**Comments:** Two litter back rest, FSN 6230-299-8353, one modified to allow folding and one unmodified, were tested to determine if they were safe for use by patients during take-off and landing in aeromedical evacuation aircraft. The tests indicated that both the modified and unmodified back rests can withstand the forces applied to them by a 250-pound patient during aircraft acceleration for take-off and climb to altitude.

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **LITTER ENPLANING - DEPLANING DEVICE (LEDD)** | **Local Fabrication** |

**Evaluation Date:** October 1 1974

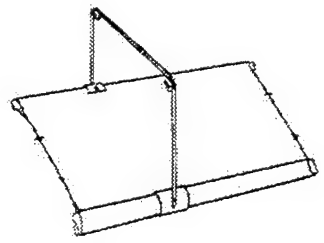
**Description:** The LEDD consists of a Davis buckle, a Tridair tiedown fitting, and two pieces of olive drab, 1" nylon webbing. One piece of nylon webbing, 22 1/2" in length, is attached at one end to the ring of the Tridair tiedown fitting and at the other end to the Davis buckle. The nylon webbing is doubled back and sewn for a distance of 3 inches from both the tiedown fitting and buckle. With the LEDD in use, the distance from the track on the litter stanchion to the buckle will be approximately 18 inches. The other piece of nylon webbing is approximately 30 inches in length has a 3" loop sewn at one end to fit around a NATO litter pole. The other end is looped through the Davis buckle and the end is doubled back and sewn to prevent slipping out of the buckle.




**Power Requirements:** None

**Comments:** The litter enplaning-deplaning device (LEDD) for aeromedical airlift aircraft met the design requirements and is acceptable for use on C-141 and C-130 aircraft. A list of parts is contained in Report SAM-TR-75-1, Litter Enplaning-Deplaning Device, January 1975. To obtain a copy write or call the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Rd., Springfield VA 22161. Telephone: (703) 487-4650.

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **LITTER LINEN LIFT** | **Contract** |
| **Evaluation Date:** July 1 1973 | |



Lift In Position

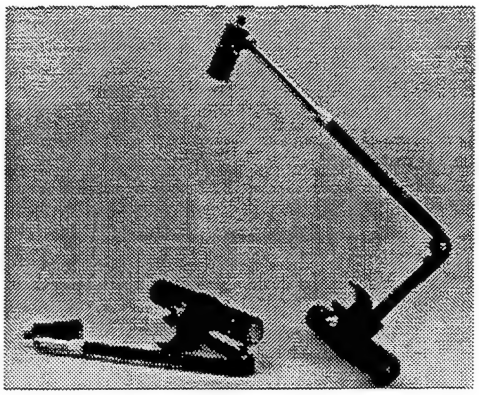
**Description:** The improved linen is a tubular stainless steel folding frame which clasps to the poles of the standard NATO litter. The frame is comprised of a horizontal bar assembly and two vertical bar assemblies with contoured stainless steel clasps.

**Power Requirements:** None

**Comments:** The redesigned litter linen lift meets the performance specifications and fulfills the development objective. Engineering drawings for the lift are on file at the Engineering Data Center, 2750 ABW/EDDR, Wright-Patterson AFB, Ohio. No. 731813 - Linen Lift Assembly

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **LITTER MOUNTED EXAMINATION LAMP** | **Local Fabrication** |

**Evaluation Date:** March 1 1973



**Description:** The Litter Mounted Examination Lamp is a self-contained, battery operated source of illumination which can be mounted on a NATO litter pole and adjusted by means of a telescoping jointed arm for illuminating specific areas. The telescoping arms maximum extension is 32". The lamp has a three level brightness control and a divergent beam that provides uniform surface illumination.

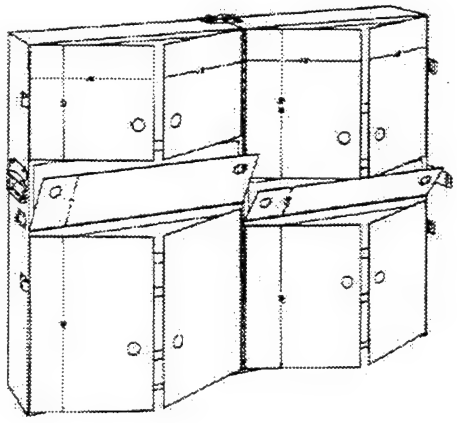
**Power Requirements:** Battery operated

**Comments:** The Litter Mounted Examination Lamp was tested in operational aeromedical evacuation aircraft and found to be entirely satisfactory for patient care during transport. Engineering drawings for the Lamp are on file at the Engineering Data Center, 2750 ABW/EDDR, Wright-Patterson AFB, Ohio. No. 721100 - Assembly of Lamp, Examination - Litter Mounted

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **MEDICAL TREATMENT CHEST** | **Local Fabrication** |

**Evaluation Date:** July 1 1974

**Description:** The medical treatment chest for tactical aeromedical airlift aircraft is a portable, compartmentalized unit. It is constructed in two halves and connected by a full length piano hinge. Doors on each compartment prevent spillage and maintain cleanliness of stored items. Two doors are suspended horizontally which provide a work surface. Four hook type devices are affixed to the back of the unit to allow securing to Evans Seat Back railing.



**Power Requirements:** None

**Comments:** The medical treatment chest for tactical aeromedical airlift aircraft met the design requirements and is acceptable for use on C-130 aircraft. A list of parts is contained in Report SAM-TR-74-61 Medical Treatment Chest for Tactical Aeromedical Airlift Nov. 74. This technical report can be obtained by writing or telephoning: U.S. Department of Commerce, National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, (703) 487-4650

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **MODESTY CURTAIN, DISPOSABLE** | **Kimberly Clark Corp.**<br>**P.O. Box 2001**<br>**Neenah, WI 54956** |

**Evaluation Date:** July 1 1973

**Description:** The Disposable Modesty Curtain is constructed of a blue colored, Kaycel fabric. Seven self-adhering tape strips of various lengths and intervals are sewn along the horizontal plane of the curtain for attachment to a NATO litter. A split, with an 8" overlap, is provided in the center of the curtain to provide access to the patient.

Sorry, no picture available.

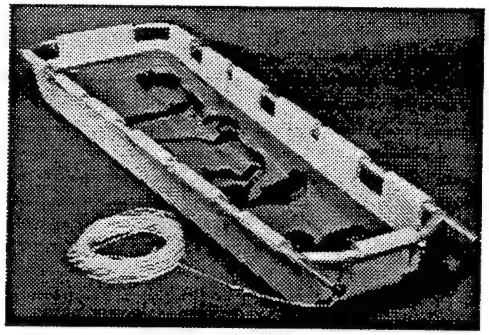
**Power Requirements:** None

**Comments:** The improved (second) prototype) disposable modesty curtain is suitable for use onboard C-141 and C-130 aircraft. The fasteners are available.

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **MODIFIED STOKES LITTER** | **Contract** |

**Evaluation Date:** September 1 1975

**Description:** Not available in record



**Power Requirements:** None

**Comments:** The structural integrity of two modified Stokes Litters was evaluated by comparison to the original unmodified litter. The modifications included:

1. Incorporation of the quick release pin (MS 17990). The litter was found to have a 57% improvement in landing stress.

2. Incorporation of tube fittings was found to be equal to or better than the unmodified litter.

# ACCEPTABLE

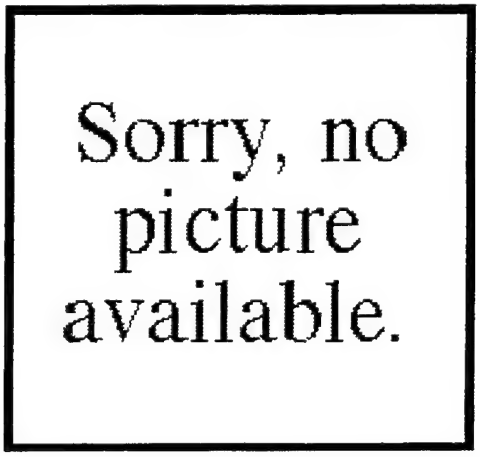
## MISCELLANEOUS

## NELKIN/PIPER DIGITAL THERMOMETER, MODEL 268

**Nelkin/Piper International**
**811 Wyandotte Street**
**P.O. Box 807**
**Kansas City, MO 64141**
**(800) 523-7521 & (816) 842-1711**

**Evaluation Date:** March 1 1987

**Description:** The Nelkin/Piper Digital Thermometer, Model 268 is a small, light weight thermometer designed for oral and axillary use. A liquid crystal display indicates body temperature in degrees s Fahrenheit, with a range of 89.6 degrees to 107.7 degrees F (32 degrees to 42 degrees C). The degrees F indicator in the display flashes until the unit is finished measuring temperature. To conserve battery life, an automatic power off feature turns the thermometer off approximately eight minutes after the device is turned on. The thermometer is supplied with a plastic storage container and disposable probe covers.




**Power Requirements:** 1.55 VDC, Internal Type SR41 silver oxide battery

**Comments:** Users should closely supervise all patients utilizing this device to prevent the thermometer's sensor or sensor stem from being bent, bitten, or dropped. The liquid crystal display on the Model 268 is significantly smaller than the display on the Model 270.

# ACCEPTABLE

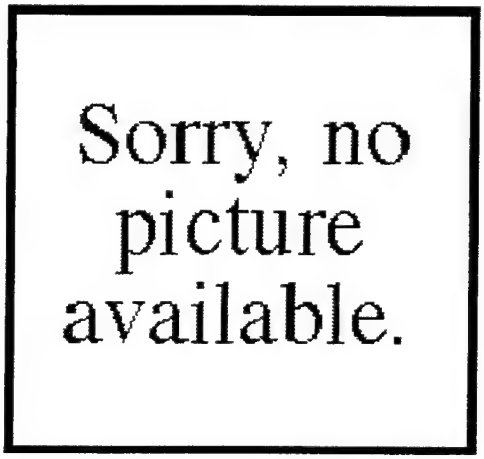
## MISCELLANEOUS

## NELKIN/PIPER DIGITAL THERMOMETER, MODEL 270

**Nelkin/Piper International**
**811 Wyandotte Street**
**P.O. Box 807**
**Kansas City, MO 64141**
**(800) 523-7521 & (816) 842-1711**

**Evaluation Date:** March 1 1987

**Description:** The Nelkin/Piper Digital Thermometer, Model 270 is a small, lightweight thermometer designed for oral, axillary, and rectal use. A liquid crystal display indicates body temperature in degrees s Fahrenheit ( degrees F), with a range of 95.0 degrees to 107.6 degrees F (35 degrees to 42 degrees C). The degrees F indicator in the display flashes until the unit is finished measuring temperature. To conserve battery life, an automatic power off feature turns the thermometer off approximately 15 minutes after the unit is turned on. The thermometer is supplied with a plastic storage container and disposable probe covers.



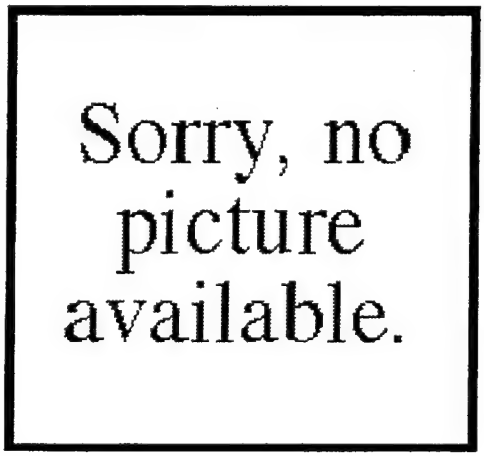

**Power Requirements:** 1.55 VDC, Internal Type SR41 silver oxide battery

**Comments:** Users should closely supervise all patients utilizing this device to prevent the thermometer's sensor or sensor stem from being bent, bitten, or dropped. The liquid crystal display on the Model 270 is significantly larger and easier to read than the display on the Model 268.

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **REDI-TEMP HEAT/COLD THERAPY SYSTEM** | **Temp Aid, Inc.**<br>**3443 Camino Del Rio South**<br>**San Diego, CA 92120**<br>**(714) 283-6271** |

**Evaluation Date:** February 7 1971

**Description:** The Redi-Temp Heat/Cold Therapy System consists of an insulated mylar plastic package, within soft, pliable outer cover, in which a pouch of dry chemicals is immersed in activating solvent. Alight blow to the pack breaks the inner pouch causing a chemical reaction resulting in an controlled temperature on the outer surface of the pack. A gelling agent within the solution provides resilience while permitting the pack to readily conform to the contour of the surface to which it is applied.




**Power Requirements:** Chemical Reaction

**Comments:** Test results of the thermal characteristics of the various warm and cold packs, using human subjects, showed significant variations from that reported by the manufacturer. This difference may primarily result from variations in test methods and procedures. The significance of the thermal characteristics versus therapeutic value of these units was not ascertained in this evaluation and is relegated to the physician in charge and or the user organization. The warm and cold packs could be easily activated and there was no chemical leakage during storage, activation, and subsequent use. No apparent damage to the warm and cold packs occurred during altitude testing. The solution within the packs was no caustic to the skin. The possibility of attaining the special conditions necessary for these items to create or enhance the danger of a fire or explosion onboard an aeromedical airlift aircraft is extremely remote.

CONDITIONAL

MISCELLANEOUS

# REMIC HEADSET COMMUNICATION SYSTEM, MODEL 7800H

**Remic Corporation**
**P.O. Box 1446**
**Elkhart, IN 46515**
**(219) 293-4257**

**Evaluation Date:** March 1 1989

**Description:** The Model 7800H is a wireless communication headset which may be used by aeromedical evacuation crewmembers (AECMs) while on C-130 and C-141 aircraft. It has a transmission frequency of 49.86 megahertz.

Sorry, no picture available.

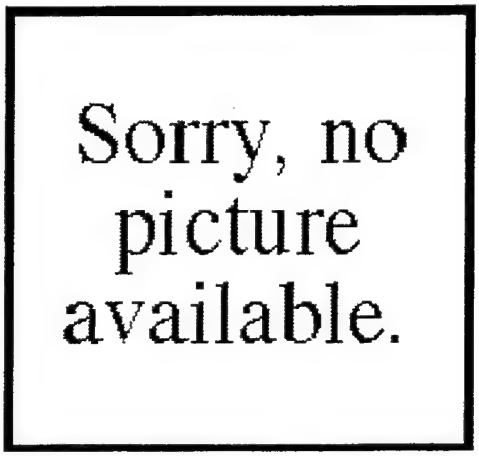
**Power Requirements:** 9 volt alkaline battery

**Comments:** Since this unit is an intentional emitter of EMI, the transmission output power created excessive electromagnetic noise which interfered with aircraft communications. However, the manufacturer has modified current production models by reducing transmission output power to acceptable levels. The maximum output power must be adjusted to 10 milliwatts (mW). A label stating certification for aeromedical evacuation must be on each headset. Modified headsets must be labeled "Approved for inflight use on AE missions," to prevent inadvertent use of unmodified units. If the headset has no such label, it should not be used.

| CONDITIONAL | MISCELLANEOUS |
|---|---|
| **REMINGTON ELECTRIC SHAVER ELECTRO SHAVE 6** | **Remington Company** |

**Evaluation Date:** August 17 1972

**Description:** Not available in record




**Power Requirements:** 115 VAC 60 Hz or Battery

**Comments:** Three Remington Electric Shavers, Model Electro Shave 6 were tested for electromagnetic interference (EMI). The shaver's radiation and conducted emission do not exceed the limits specified by MID-STD 461A when operating only on battery power. Testing requested by Head Quaters Military Airlift Command.

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **RF NURSE CALL SYSTEM - MEDICALL** | **Linear Corp.**<br>**347 S. Glascow Ave.**<br>**Inglewood, CA 90301**<br>**(213) 678-4242** |

**Evaluation Date:** July 1 1973

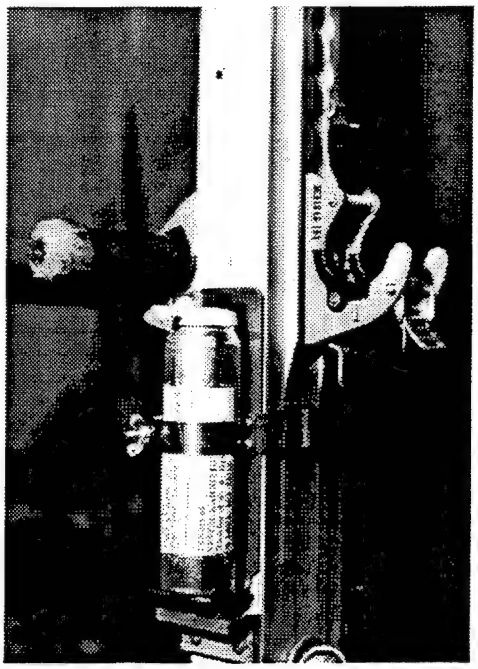
**Description:** The MEDICALL, or inflight radio frequency call system, was designed and fabricated for use in worldwide aeromedical airlift operations on multi-mission aircraft. No equipment in the present inventory fulfills this requirement.

**Power Requirements:** Battery

**Comments:** The system met the stated objectives, enabled aeromedical crewmembers to assist litter patients more efficiently, and was enthusiastically endorsed by them during operational test and evaluation.

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **SEPTISOL FOAM (4.6 OZ) DISPENSER MOUNT** | **Local Fabrication** |

**Evaluation Date:** June 1 1973



**Description:** The redesigned dispenser mount is an anodized aluminum L-shaped bracket 2" W X 6" H , with a 1 3/4" base which has two upward flared corners. A 1" wide velcro and web strap assembly and a stainless steel clamp are riveted on the front surface of the bracket. a synthetic rubber pad is glued to the back of the bracket.

**Power Requirements:** None

**Comments:** According to MAC, TAC, PACAF, and USAFE OT&E reports, the redesigned dispenser mount meets design and performance specifications and fulfills the development objective. The septisol foam is an acceptable hand disinfectant. It is not satisfactory as a cleanser to remove dirt. A reprocurement package was developed to enable major commands to procure operational quantities of the dispenser mount. The prototype dispenser mounts were permanently transferred to the aeromedical squadrons for operational use. Engineering drawings are on file at the Engineering Data Center, 2750 ABW/EDDR Wright-Patterson AFB, Ohio. No. 73100 - Mount, Dispenser, Hand Disinfectant, Aerosol Foam.

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **STERITEMP DIGITAL THERMOMETER, MODEL MT-500-1** | **Steridyne Corporation**<br>**3725 Investment Lane**<br>**Riveria Beach, FL 33404**<br>**(800) 327-6185** |

**Evaluation Date:** July 1 1987

**Description:** The Steritemp Digital Thermometer, Model MT-500-1 is a small, lightweight digital thermometer designed for oral, axillary, and rectal use. A liquid crystal display indicates body temperature in degrees s Fahrenheit ( degrees F), with a range of 89.6 degrees F to 107.6 degrees F (32 degrees C to 42 degrees C). The degrees F indicator in the display stops flashing and an audible alarm signals when the thermometer is finished measuring body temperature. To conserve battery life, an automatic power off feature turns the thermometer off approximately 10 minutes after the unit is turned on. The thermometer is supplied with disposable probe covers.

Sorry, no picture available.

**Power Requirements:** Battery, 1.55 VDC, Type SR41

**Comments:** Based on test results the Steritemp Digital Thermometer is acceptable for use on board United States Air Force aeromedical evacuation aircraft. Patients should be closely monitored when obtaining temperatures to prevent the thermometer's sensor or sensor stem brom being bent, bitten, or dropped.

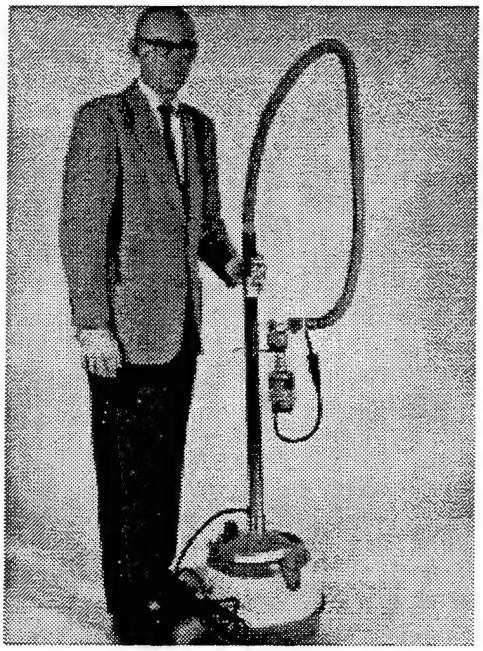
# UNACCEPTABLE

## MISCELLANEOUS

## STRYKER CAST CUTTER PLASTER VAC, MODEL 845

**Stryker Corporation**
**420 Alcott Street**
**Kalamazoo, MI 49001**
**(616) 381-3811**

**Evaluation Date:** November 1 1970



**Description:** Not available in record

**Power Requirements:** 110 VAC 60 Hz

**Comments:** Based upon tests , the cast cutter is unacceptable for routine use on United States Air Force aeromedical airlift. Those characteristics subject to objection are: 1) the electromagnetic interference from the unit exceeds limits prescribed in MIL-STD-461A and 462, 1 May 70; 2) the unit will not operate at 115 VAC 400 Hz which is the available electric power on the multi-purpose aircraft configured for aeromedical airlift; and 3) it is not configured for convenient handling on a multi-purpose aircraft configured for aeromedical airlift.

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **STRYKER WEDGE TURNING FRAME MODEL 124** | **Stryker Corporation**<br>**420 Alcott Street**<br>**Kalamazoo, MI 49001**<br>**(616) 381-3811** |

**Evaluation Date:** December 1 1971

**Description:** Not available in record

Sorry, no picture available.

**Power Requirements:** None

**Comments:** In February 1972, a comparison evaluation of FSN 6530-929-1975 turning frame, Orthopedic Bed, Stryker (Wedge frame) and FSN 6530-680-0501 turning frame, Orthopedic bed, Stryker (A Frame) as they are now supplied by the Defense Support Center was accomplished. Results of the comparison evaluation indicated that the Stryker Wedge Frame was equal to or better than the A-Frame with the exception of three areas: stability, standard traction devices, and instructions. The Stryker Corporation resubmitted a frame with modifications that make it equal to the standard A-Frame and acceptable for use onboard aeromedical evacuation aircraft. Manufacturer or FSN 6530-926-1975 (modified) Initial test and evaluation indicated the turning frame was unacceptable for use.

# ACCEPTABLE

## MISCELLANEOUS

## TAKEDA MEDICAL DIGITAL THERMOMETER, MODEL UF - 10

**Takeda Medical Inc.**
**17945-G Skypark Circle**
**Irvine, CA 92714**
**(714) 630-1779**

**Evaluation Date:** March 1 1987

**Description:** The Takeda Medical Digital Thermometer, Model UF-10 is a small, lightweight thermometer designed for oral and axillary use. A liquid crystal display indicates body temperature in degrees s Fahrenheit ( degrees F), with a range of 89.6 degrees to 107.6 degrees F (32 degrees to 42 degrees C). To conserve battery life, an automatic power off feature turns the thermometer off approximately 12 minutes after the unit is turned on. The thermometer is supplied with a plastic storage container and disposable probe covers.

Sorry, no picture available.

**Power Requirements:** DC, internal type LR44 alkaline manganese dioxide battery

**Comments:** Users should closely supervise all patients utilizing this device to prevent the thermometer's sensor or sensor stem from being bent, bitten, or dropped, and to prevent the internal battery from being accidentally ingested. Users must time the temperature taking procedure since there is no measurement complete indicator.

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **TEMPA-DOT SINGLE USE ORAL THERMOMETER** | **Info-Chem Inc.**<br>**(800) 631-3409** |

**Evaluation Date:** October 1 1976

**Description:** The Tempa-Dot single use oral thermometer provides an accurate, reliable, safe method for routine clinical temperature monitoring. It can be obtained in either a Centigrade of Fahrenheit version. The thermometers are individually packaged and sterilized.

Sorry, no picture available.

**Power Requirements:** None

**Comments:** If the thermometers are stored in a temperature above 86 degrees F (30 degrees C), the minimum time required for the registering of the patient's temperature under normal conditions is 30 seconds. If the thermometers are stored in a temperature below 59 degrees F (15 degrees C), the minimum time required for registering of the patient's temperature will increase to approximately 60 seconds. If the thermometers are stored in a 120 degrees F (49 degrees C) temperature environment for a period of 2 to 6 hours, placement in normal conditions for a least 20 minutes is required prior to use.

# UNACCEPTABLE

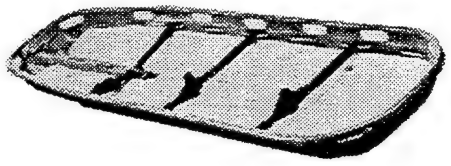
## MISCELLANEOUS

## THOMPSON CARRIER LITTER

**Thompson Carrier Company**
**1531 Monrovia Street**
**Newport Beach, CA 92660**
**(714) 645-1995**

**Evaluation Date:** June 1 1976

**Description:** The two-piece litter is constructed of a high density polyethylene shell. Two metal rods attached by pit pins, and three sets of metal support sleeves, attached by wing nuts and bolts, allow the litter to be disassembled and placed on a pack frame for overland transportation. The litter contains a polyurethane pad secured to the litter by metal rivets. Additional hard foam has been placed inside the three litter channels. The body and polyurethane portions of the litter are perforated by numerous two and three inch holes.



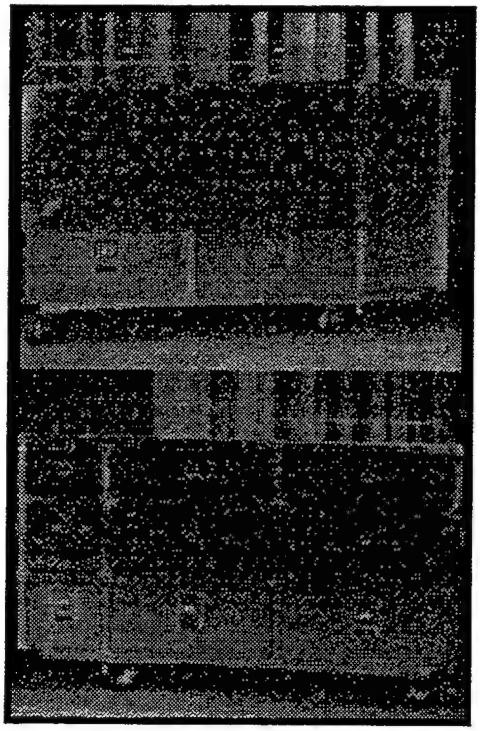
**Power Requirements:** None

**Comments:** The Thompson Carrier does not possess aerodynamic or rotational stability when exposed to helicopter (H-53) rotor wash, nor does it provide sufficient buoyancy to insure survivor protection during water recoveries.

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **TRANSPORTABLE AIRBORNE THERAPEUTIC STATION (TATS)** | **Contract** |

**Evaluation Date:** August 1 1973

**Description:** The TATS was designed to meet an urgent operational requirement for a carrier-container to facilitate the transport, orderly stowage, and convenient access to medical equipment, supplies and records during patient transport on multipurpose C-141 aircraft. The TATS consists of two specially designed compartmentalized structures that roll on casters and have mechanisms for securing them into the C-141 seat track at the medical crew station location. The TATS contains, and makes readily available, the medical and patient support equipment and supplies required for patient support during the airlift portion of aeromedical evacuation missions. The two units are designated the Medical Crew Director (MCD) substation, and the Medical (MED) substation. The MCD substation provides for the stowage of large items such as medical records, oversized x-ray envelopes, respirators, suction pumps, oxygen bottles, sheets, covers, etc. The MED substation provides special compartments for the stowage of medications, syringes, dressings, patient monitoring devices, surgical equipment, etc. Each substation occupies the space of three seats and, for operational use, is positioned directly in front of the seats assigned to the medical crew. An in-house development was initiated at the United States Air Force School of Aerospace Medicine and prototype TATS sets were designed and fabricated. Evaluations indicated the TATS fulfilled the requirement for operational use.



**Power Requirements:** None

**Comments:** Engineering drawings are on file at the Engineering Data Center, 2750 ABW/EDDR Wright-Patterson AFB, Ohio. No. 7037674 - Transportable Airborne Therapeutic Station Assembly.

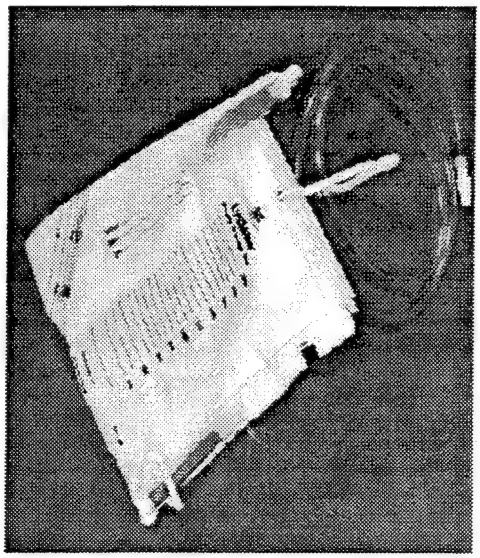
# UNACCEPTABLE

## MISCELLANEOUS

## TRAVENOL CYSTOFLO II CLOSED URINARY DRAINAGE SYSTEM

**Travenol Laboratories, Inc.**
**One Baxter Parkway**
**Deerfield, IL 60015**
**(312) 948-2000**

**Evaluation Date:** June 1 1979



**Description:** The Travenol Cystoflo II Drainage Bag is a disposable urinary drainage bag with a sample port and an anti-reflux valve. It provides a closed system for the collection and measurement of urinary output. An anti-reflux valve is provided to prevent urine returning to the bladder should the bag be placed on the same level as the bladder.

**Power Requirements:** None

**Comments:** Failed in RD testing. The device is acceptable for use onboard Air Rescue & Recovery Service helicopters without additional means of venting.

| ACCEPTABLE | MISCELLANEOUS |
|---|---|
| **UNI-TEMP SINGLE USE THERMOMETER** | **Bio-Medical Sciences, Inc.**<br>**140 New Dutch Lane**<br>**Fairfield, NJ 07006** |
| **Evaluation Date:** November 1 1976 | |

**Description:** The Uni-temp single use thermometer is a sterile, disposable unit that can be used to obtain oral temperatures, and with a rectal sheath, rectal temperatures. Under normal conditions, temperature is registered within 30 seconds.

Sorry, no picture available.

**Power Requirements:** Internal Chemical Reaction

**Comments:** It should be stored at temperatures below 87 degrees F (30.5 degrees C). If not, time at normal temperature conditions is required for the recrystallization process of the chemical mixture to occur. The thermometer is available in either centigrade or Fahrenheit version.

# UNACCEPTABLE

**MISCELLANEOUS**

## VALLEYLAB FORCE 1B ELECTROSURGICAL GENERATOR

**ValleyLab Inc.**
**5920 Longbow Dr.**
**P.O. Box 9015**
**Boulder, CO 80301**
**(303) 530-2300**

**Evaluation Date:** December 29 1993

**Description:** This unit is used for electrosurgical procedures in place of or in conjunction with mechanical cutting devices. Is capable of functioning in monopolar, bipolar or pure cut selections. Has a multiple of settings available. See file folder for instruction manual for more information on unit.

Sorry, no picture available.

**Power Requirements:** 85-135 VAC, 50-60 Hz

**Comments:** Failed EMI test. Unit tested by request from Air Force Special Operations Command-SG, Fort Bragg, NC. EMI and hot/cold storage testing done. No other testing was done since unit failed EMI as requested by AFSOC. Passed hot/cold storage testing.

CONDITIONAL

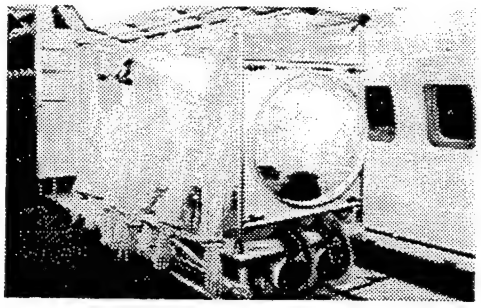
**MISCELLANEOUS**

# VICKERS AIRCRAFT TRANSIT ISOLATOR

**Vickers Limited**
**(Medical Engineering)**
**Priestley Road**
**Basingstroke**
**Hampshire**
**RG 24 9NP, England**

**Evaluation Date:** September 1 1979

**Description:** The Vickers aircraft transit isolator is a self-contained transit isolator designed for the isolation of patients requiring transportation in aircraft where the need to maintain a strict microbiological security is required. The isolator consists of a welded lower frame and attached baseboard which supports the air supply unit, filters, and the battery box. An upper demountable framework, complete with a human entry port and a supply entry port is provided. An envelope fitted with "half suits," glove sleeves, IV sleeves, and a reinforced floor to accommodate the stretcher is supplied complete with fixing points for belt attachment to the lower framework and patient restraining straps.



**Power Requirements:** 12 VDC, 30 A-H, Battery

**Comments:** Based on the results of the tests conducted, The Vickers aircraft transit isolator can be considered acceptable for use on C-130 and C-141 aircraft used for aeromedical evacuation provided the following conditions are met: (a) the liquid, lead-acid batteries be removed and replaced with gel cell type batteries, (b) all electrical connections be reworked to assure reliability, (c) capacitors be installed (as noted in paragraph 4.2 a (1) of the final test and evaluation report *) to reduce radiated emissions, (d) oxygen therapy be limited to 6 liters per minute, (e) a specially trained isolation team be utilized for all patient transfers.

# AEROMEDICAL RESEARCH STATUS GUIDE

## POWER

- ELECTRICAL CORD ASSEMBLY SET (ECAS)
- FREQUENCY CONVERTER / 400 - 60 HZ, MODEL PS-75-426-1
- OHIO GEL CELL 12V BATTERY PACK
- OHMEDA LOW MAINTENANCE BATTERY PACK, STOCK #217-3813-910
- VANNER ELECTRICAL INVERTER, MODEL SP 00112

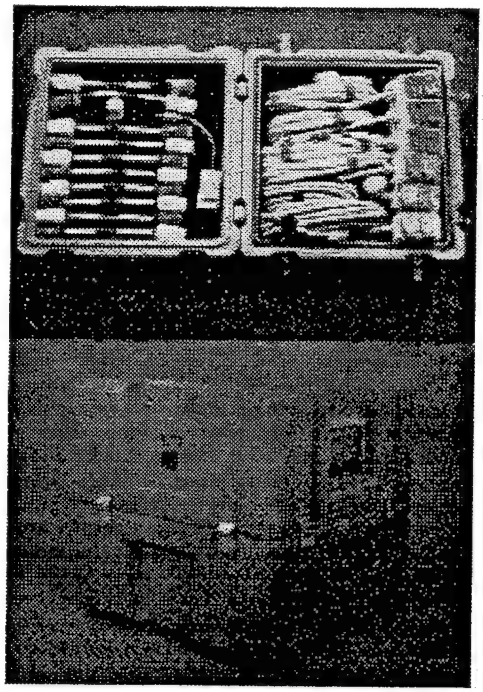
# ACCEPTABLE

## POWER

## ELECTRICAL CORD ASSEMBLY SET (ECAS)

**Technical Services Laboratory, Inc.**
**630 Lovejoy Rd.**
**Fort Walton Beach, FL 32548**
**(904) 243-3722**

**Evaluation Date:** April 15 1985



**Description:** The Electrical Cord Assembly Set, (ECAS) is a portable electrical cord kit, which provides fro proper interconnection between medical equipment and aircraft electrical power. The ECAS was primarily designed for use on C-9, C-130, and C-141B aircraft during aeromedical evacuation missions. The kit includes: hospital grade extension cords, adapters, and hand held test sets for verifying AC and DC aircraft power conditions. The kit is packaged in an environmentally secured carrying case, which provides both protection and convenient storage.

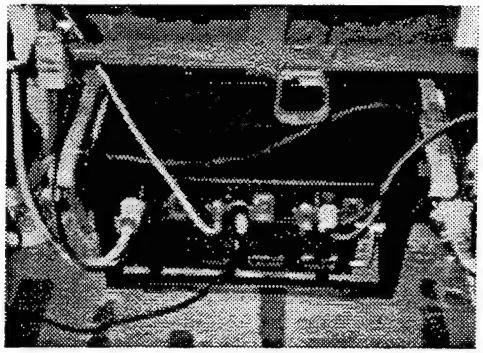
**Power Requirements:** None

**Comments:** The ECAS is considered acceptable for use on board United States Air Force aeromedical evacuation aircraft.

| ACCEPTABLE | POWER |
|---|---|
| **FREQUENCY CONVERTER / 400 - 60 HZ, MODEL PS-75-426-1** | **Unitron Inc.**<br>**1624 N. First Street**<br>**Garland, TX 75040** |

**Evaluation Date:** December 1 1975

**Description:** It consists of a Unitron Static Frequency Converter, Model PS-62-66D, mounted in a carrier assembly. The carrier assembly provides carrying bars at each end. The handles are designed to withstand a 9 G's loading without structural deformation or failure. Incorporates an acoustical sound absorber/diffuser to attenuate and diffuse noise generated by the converter cooling fan. It also has an integral cable storage cabinet and an electrical panel with three circuit breakers, a power indicating lamp, and three output receptacles.



**Power Requirements:** 115 VAC - 400 Hz

**Comments:** None

# UNACCEPTABLE

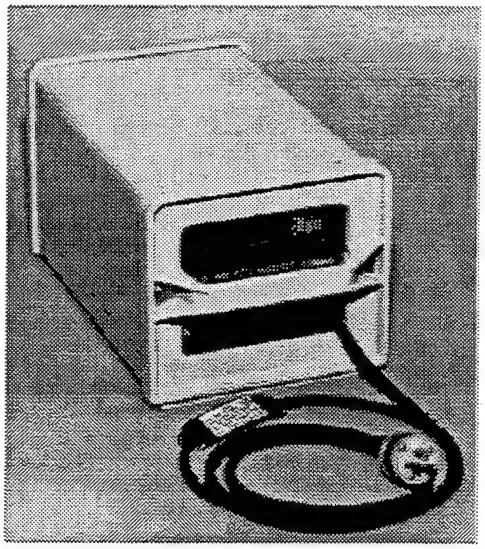
**POWER**

## OHIO GEL CELL 12V BATTERY PACK

**Ohio Medical Products**
**3030 Airco Dr.**
**P.O. Box 7550**
**Madison, WI 53707**
**(608) 221-1551**

**Evaluation Date:** September 1 1979

**Description:** The Ohio 12V Battery Pack for Transport Incubator is a portable, rechargeable source of 12 VDC power. It incorporates two Eagle-Picher Carefree spill-proof Lead acid, 6 volt batteries and a charging module in one self contained case. The battery pack requires 120 VAC, 60 -400 Hz power source to power the charging module. Once full charge is reached, the unit reverts to trickle charge and need not be disconnected from the external power source. The battery pack can be connected to the incubator during charging. The AC power line will supply power to the charging module and incubator simultaneously with the incubator selector switch in the AC power position. The incubator will not receive power from the battery pack unless the selector switch is in the 12 VDC position.



**Power Requirements:** 120 VAC 60 - 400 Hz

**Comments:** Failed EMI testing.

| ACCEPTABLE | POWER |
|---|---|
| **OHMEDA LOW MAINTENANCE BATTERY PACK, STOCK #217-3813-910** | **Ohmeda Critical Care**<br>**9065 Guilford Rd**<br>**Columbia, MD 21046-1801**<br>**(800) 527-9209** |

**Evaluation Date:** March 1 1987

**Description:** The Ohmeda (formerly Ohio) Low Maintenance Battery Pack is a portable rechargeable battery, specifically intended to power the Ohmeda Air-VAC Transport Incubator. It consists of a single 12 VDC battery and charging module mounted in a two-handled carrying case, incorporating a receptacle that permits attachment of the six-pronged incubator power plug. The non-spill, Lead acid battery is completely sealed and maintenance free. The Ohmeda Low Maintenance Battery Pack is an acceptable, inexpensive alternative to the Ohmeda Ni-Cad Battery Pack, Stock #217-3810-800, previously evaluated. The battery charge time, from full discharge to full charge, is 14-20 hours. A fully charged battery will normally provide a hood temperature of 32.2 degrees C (90 degrees F) in an ambient air temperature of 21.1 degrees C (70 degrees F) for at least 3 1/2 hours, and provide 1 1/4 hours of operation with the heater continuously operating.

Sorry, no picture available.

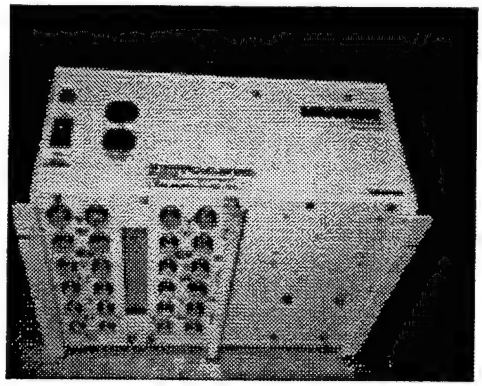
**Power Requirements:** 120 VAC 50 - 400 Hz, 3.0 amp

**Comments:** Based on test results this device is acceptable for use on United States Air Force aeromedical evacuation aircraft.

| ACCEPTABLE | POWER |
|---|---|
| **VANNER ELECTRICAL INVERTER, MODEL SP 00112** | **Vanner Incorporated<br>4282 Reynolds Dr.<br>Hilliard, OH 43026<br>(614) 771-2718** |

**Evaluation Date:** February 1 1991

**Description:** The Vanner is used to change 24 to 28 VDC aircraft power into 120 VAC 60 Hz power so that it may power medical equipment items requiring "household current." it can be powered by the 28 VDC Cannon-type plugs on each aircraft.



**Power Requirements:** 28 VDC

**Comments:** The 15-ft 4-ga cable that is provided with the Vanner is the ONLY cable that may be used to connect to aircraft power. The Vanner must be fitted with a remote switch by-pass plug. When secured on the aircraft, at least four inches of clearance must be around and above the Vanner. Whenever maintenance is performed, broken or displaced tie-wraps must be checked.

**Only certain medical equipment items may be powered by the Vanner. Those are the Bear 33 ventilator, Bard-Parker wrap-around nebulizer heater, Impact Model 308M suction, and the Protocol ProPaq Model 106 vital signs monitor. No other devices may be powered by the Vanner without prior laboratory testing.**

# AEROMEDICAL RESEARCH STATUS GUIDE

## PULSE OXIMETERS

- BIOCHEM 3040 PULSE OXIMETER
- BIOCHEM MICROSPAN 1040A PULSE OXIMETER
- BTI BIOX IV OXIMETER
- CRITICARE SYSTEMS OXYGEN SATURATION MONITOR, MODEL 501DC
- HEWLETT PACKARD EAR OXIMETER 47201A
- NELLCOR N-200 PULSE OXIMETER
- NONIN 8500 HAND HELD PULSE OXIMETER
- NONIN 8600 PULSE OXIMETER
- NONIN 8604D-L PULSE OXIMETER
- NOVAMETRIX Tc02METTE PORTABLE TcPO2 MONITOR, MODEL 809
- OXIMETRIX SHAW CATHETER OXIMETER

# UNACCEPTABLE

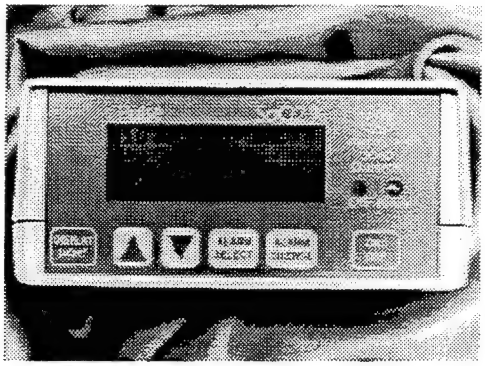
## PULSE OXIMETERS

## BIOCHEM 3040 PULSE OXIMETER

**Biochem International Inc.**
**W238 N1650 Rockwood Dr.**
**Waukesha, WI 53188**
**(800) 558-2345 & (414) 542-3100**

**Evaluation Date:** December 30 1988

**Description:** Record has no description of unit tested, nor does it contain a final report on status of testing.



**Power Requirements:** 115 VAC 60 Hz

**Comments:** Failed EMI testing. New improved model sent with fixes, see report on 1040A.

CONDITIONAL

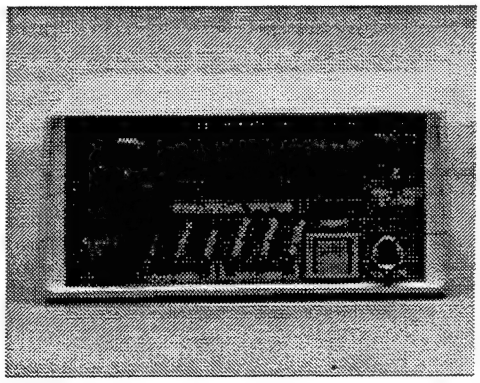
# PULSE OXIMETERS

## BIOCHEM MICROSPAN 1040A PULSE OXIMETER

**Biochem International Inc.**
**W238 N1650 Rockwood Dr.**
**Waukesha, WI 53188**
**(800) 558-2345**

**Evaluation Date:** December 1 1989

**Description:** The Biochem Microspan 1040A is a small and portable pulse oximeter. It non-invasively monitors and determines arterial blood oxygen saturation and pulse by measuring changes in the absorption of red and infrared light passed through vascular tissue. Features include easy to read LED displays, perfusion status indicator, high/low SaO2% and pulse audible and visual alarms, audible pulse tone, adjustable alarm volume and an 18-hour memory which can be downloaded to a strip-chart recorder. Alarm setting switches for SaO2% and pulse are located on the back and bottom of unit. The 1040A's internal battery will last up to 20 hours.



**Power Requirements:** 115 VAC 60 - 400 Hz, 0.15 amp or Internal rechargeable battery

**Comments:** As with any pulse oximeter patient movement or vibration of the unit may cause the pulse rate display to be erratic and unreliable; therefore, it should only be used for trend analysis of the patient pulse rate. Though patient movement or vibration doesn't seem to affect the SaO2% reading, it should also only be used for trend analysis of the patient's SaO2%.

The unit uses a Model 1044 battery charger/power cord which must be modified with a 1000µF capacitor to pass EMI at 400 Hz.

The Model 1044 battery charger/power cord will not adequately fit the Electrical Cord Accessory Set (ECAS) used on the C-130 and C-141B or the C-9A 115 VAC 60 Hz outlets. A 15.24 cm (6 inch) extension/adapter (no model number or other designation) was made by the manufacturer to facilitate connection of the Model 1044. The extension adapter has been EMI tested, and is acceptable for use. There were problems charging the 1040A using 50 Hz power at some overseas locations. Further testing and evaluation for 50 Hz use may be required. Regardless of the outcome , the 1040A may be effectively charged on 60 Hz or 400 Hz power and operated on 60 Hz, 400 Hz or internal battery.

| UNACCEPTABLE | PULSE OXIMETERS |
|---|---|
| **BTI BIOX IV OXIMETER** | **Bioximetry Technology Inc.**<br>**4765 Walnut Street**<br>**Boulder, CO 80301** |
| **Evaluation Date:** August 17 1984 | |

**Description:** None available in file.

Sorry, no picture available.

**Power Requirements:** Not recorded

**Comments:** Failed EMI testing.

CONDITIONAL

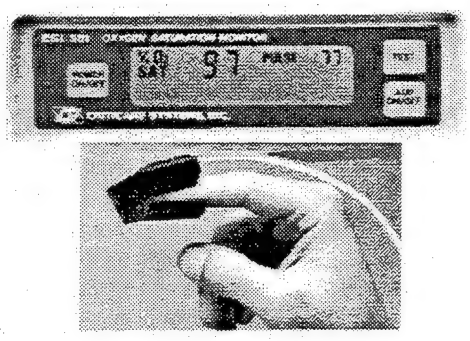
# PULSE OXIMETERS

## CRITICARE SYSTEMS OXYGEN SATURATION MONITOR, MODEL 501DC

Criticare Systems Inc.
P.O. Box 26556
Milwaukee, WI 53213
(414) 691-2828

**Evaluation Date:** February 1 1987

**Description:** The Criticare Systems oxygen saturation monitor, Model 501DC, provides a means for continual monitoring of a patient's oxygen saturation. The 501DC CSI is a compact and lightweight portable unit powered by four size AA batteries. The unit is operated with three push buttons; power on/off, test, and audible alarm on/off. The unit displays continuous O2 SAT, and continuous pulse rate with LCD read out. Audible and visual alarms provide detection of low saturation levels (<80%). An automatic system check provides diagnostic messages including, low battery, sensor off and low pulse. A non-invasive, clip-on finger sensor is provided with the 501DC CSI oxygen saturation monitor.



**Power Requirements:** Battery, Four AA or may use rechargeable Ni-Cads or disposable alkaline. (Separate charger required)

**Comments:** Based on limited conducted tests, per request of Head Quaters Military Airlift Command, the device's performance is acceptable at altitude and rapid decompression. EMI should not present a problem for the monitor or the aircraft. The user should be aware of the unit's susceptibility to patient/sensor movement.

# UNACCEPTABLE

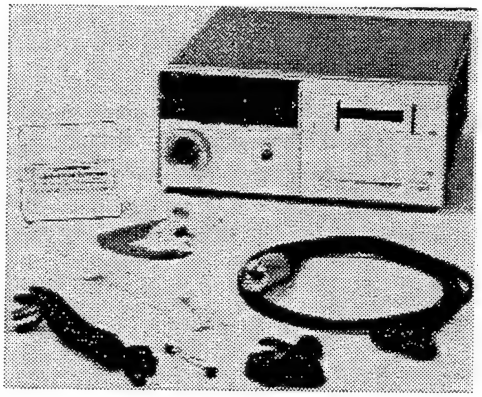
## PULSE OXIMETERS

## HEWLETT PACKARD EAR OXIMETER 47201A

**Hewlett Packard**
**175 Wyman Street**
**Waltham, MA 02154**
**(617) 890-6300**

**Evaluation Date:** August 31 1978

**Description:** An accurate method of measuring oxygen saturation, non-invasively. Discrete or continuous measurements can be made without involving the patient in any calibration or standardization. Neither must one be concerned with skin pigment, ear thickness, the presence of other light absorbers or ear probe motion.



**Power Requirements:** 115 VAC 50/60 Hz

**Comments:** Evaluation suspended on 7 Sept. 76. On 31 Aug. 78 reevaled Failed EMI testing.

CONDITIONAL

# PULSE OXIMETERS

## NELLCOR N-200 PULSE OXIMETER

Nellcor Inc.
25495 Whitesell Street
Hayward, CA 94545
(800) 635-5267

**Evaluation Date:** April 1 1990

**Description:** Not available in record

Sorry, no picture available.

**Power Requirements:** 110 VAC 60 Hz, 0.3 amp or Internal battery

**Comments:** The N-200 was evaluated as a component of the International Biomedical Neonatal Transport system. It failed EMI testing using 110 VAC as the power source, despite extensive modification. When modified using an "hf suppresser" attached to the patient cable, and a special wrap made of a material called "KV-GARD," the unit passes electromagnetic interference when operated using battery power. Therefore, the N-200 may be used on aeromedical flights only when modified, and only on battery power. The expected battery life is less than 2 hours. The N-200, when modified for electromagnetic interference, and when used on battery power, may be used apart from or as a component of the Neonatal Transport System.

**WARNING: DO NOT PLUG IN THE NELLCOR WHILE INFLIGHT. DOING SO COULD INTERFERE WITH AIRCRAFT COMMUNICATION AND NAVIGATION SYSTEMS.**

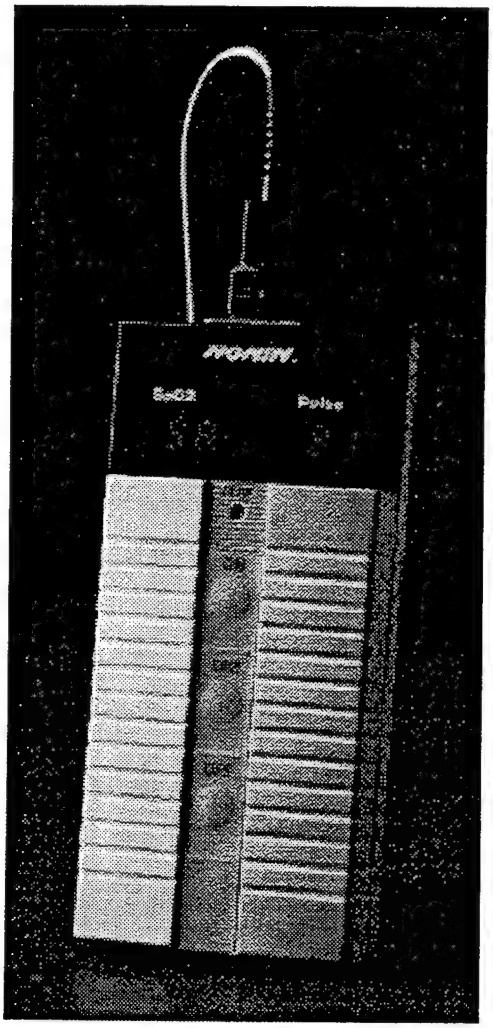
# ACCEPTABLE

## PULSE OXIMETERS

## NONIN 8500 HAND HELD PULSE OXIMETER

**Nonin Medical, Inc.**
**12900 Highway 55**
**Plymouth, MN 55441**
**(800) 356-8874**

**Evaluation Date:** October 1 1992




**Description:** The Nonin 8500 is a small and portable hand held pulse oximeter weighing only 10 ounces. It non-invasively monitors and determines arterial blood oxygen saturation and pulse by measuring changes in the absorption of red and infrared light passed through vascular tissue. Features include: easy to read LED displays, perfusion status indicator, 80 hour battery life with alkaline batteries, and optional 18 hour memory. The SaO2% range is 0-100% and the pulse rate range is 18-300. This unit was evaluated with the optional carrying case (8500CC). Because of its small size, it does not contain any alarm functions. However, it is designed for use in situations where alarms are not required such as spot checks of SaO2% prior to or after administering O2, or transport where medical personnel are attending the patient.

**Power Requirements:** 6 AA Alkaline batteries or use rechargeable AA batteries

**Comments:** As with any pulse oximeter, patient movement may cause the pulse rate display to be erratic and unreliable at times; therefore, it should only be used for trend analysis of the patient pulse rate. Though patient movement or vibration doesn't seem to affect the SaO2% reading, it should also only be used for trend analysis of the patient's SaO2%.

# ACCEPTABLE

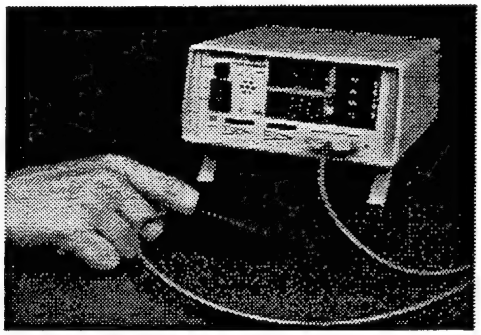
## PULSE OXIMETERS

## NONIN 8600 PULSE OXIMETER

**Nonin Medical, Inc.**
**12900 Highway 55**
**Plymouth, MN 55441**
**(800) 356-8874**

**Evaluation Date:** October 1 1992

**Description:** The Nonin 8600 pulse oximeter is small and portable with a weight of approximately 2 lbs. It non-invasively monitors and determines arterial blood oxygen saturation and pulse by measuring changes in the absorption of red and infrared light passed through vascular tissue. Features include: easy to read large LED displays, perfusion status indicator, high/low SaO2% and pulse audible/visual alarms (visual - flashing numeric LED display), audible adjustable pulse tone (from OFF to 70 dB) that varies with changes in SaO2%, adjustable alarm volume from 60-80 dB and OFF, sensor alarm, and all switches are located on the front of the unit for easy access. The battery life is 30 hours on a full charge, with a recharge time of 15 hours from a fully depleted battery. The 8600 is available with optional 18-hour memory. The SaO2% range is 0-100% and the pulse rate range is 18-300.



**Power Requirements:** 120 VAC 60 - 400 Hz or Internal rechargeable battery

**Comments:** The unit uses a Nonin Model 7708 AC adapter/battery charger which is modified with a 1000µF capacitor to pass EMI at 400 Hz.

As with any pulse oximeter, patient movement may cause the pulse rate display to be erratic and unreliable at times; therefore, it should only be used for trend analysis of the patient's pulse rate. Though patient movement or vibration doesn't seem to affect the SaO2% reading, it should also only be used for trend analysis of the patient's SaO2%.

# ACCEPTABLE

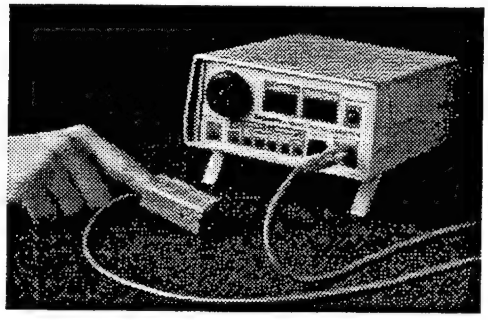
## PULSE OXIMETERS

## NONIN 8604D-L PULSE OXIMETER

**Nonin Medical, Inc.**
**12900 Highway 55**
**Plymouth, MN 55441**
**(800) 356-8874**

**Evaluation Date:** October 1 1992

**Description:** The Nonin 8604D-L pulse oximeter is small and portable with a weight of approximately 2 lbs. It non-invasively monitors and determines arterial blood oxygen saturation and pulse by measuring changes in the absorption of red and infrared light passed through vascular tissue. Features include: easy to read LED displays, perfusion status indicator, high/low SaO2% and pulse audible/visual alarms, audible pulse tone, adjustable alarm volume from 60-80 dB, sensor alarm, high/low pulse alarm-setting switches on bottom of unit, and the ON/OFF switch on back of unit. The battery life is 20 hours on a full charge, with a recharge time of 15 hours from a fully depleted battery. The 8604D-L is available with optional 18-hour memory. The SaO2% range is 0-100% and the pulse rate range is 18-300.



**Power Requirements:** 120 VAC 60 - 400 Hz or Internal rechargeable battery

**Comments:** The unit uses a Nonin Model 7708 AC adapter/battery charger which is modified with a 1000µF capacitor to pass EMI at 400 Hz.

As with any pulse oximeter, patient movement may cause the pulse rate display to be erratic and unreliable at times; therefore, it should only be used for trend analysis of the patient's pulse rate. Though patient movement or vibration doesn't seem to affect the SaO2% reading, it should also only be used for trend analysis of the patient's SaO2%.

CONDITIONAL

# PULSE OXIMETERS

## NOVAMETRIX Tc02METTE PORTABLE TcPO2 MONITOR, MODEL 809

**Novametrix Medical Systems, Inc.**
**1 Barnes Industrial Park Rd.**
**P.O. Box 690**
**Wallingford, CT 06492**
**(203) 265-7701**

**Evaluation Date:** September 1 1981

**Description:** The Novametrix Transcutaneous Oxygen Monitor (TcO2mette) is a portable non-invasive transcutaneous oxygen monitor. The TcO2mette provides a continuous measurement of transcutaneous oxygen tension (TcPO2) and local perfusion. The oxygen electrode temperature can be dialed in and displayed on the display panel as long as the temperature display push-button is depressed. High and low alerts are provided for both the TcPO2 value and the oxygen electrode temperature.

**Power Requirements:** 110 VAC 60 Hz (not tested on 400 Hz) or Battery

**Comments:** Based on the results of the tests conducted, the Novametrix TcO2mette 809 Portable Transcutaneous Oxygen Monitor can be considered acceptable for use in aircraft used for aeromedical evacuation provided the following modifications are performed on any device for this purpose:

a. Resistor R-78 (1K megohm) onboard 2030 is "cushioned" with some type of silicone compound.

b. The shield assembly, for above resistor, is soldered to the PC board at all four corners.

| UNACCEPTABLE | PULSE OXIMETERS |
|---|---|
| **OXIMETRIX SHAW CATHETER OXIMETER** | **Oximeter Systems, Oximetrix, Inc. 1212 Terra Bella Ave. Mountain View, CA 94043 (415) 961-4380** |

**Evaluation Date:** December 17 1981

**Description:** The unit is designed to measure arterial oxygen saturation (SaO2). The SaO2 is then continuously displayed on a digital display.

Sorry, no picture available.

**Power Requirements:** 110 VAC 60 Hz

**Comments:** Failed EMI testing. See file for more information.


# AEROMEDICAL RESEARCH STATUS GUIDE

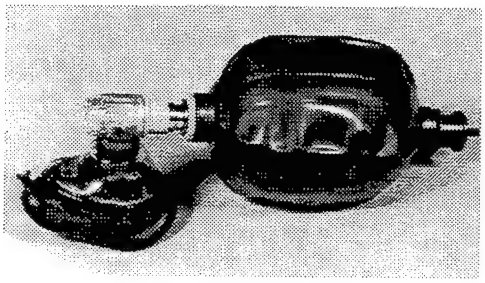
## RESPIRATORY

- ADULT AMBU RESUSCITATOR WITH E-2 VALVE AND NR VALVE
- AIR-SHIELDS AS 301 TCPCO2 MONITOR
- AIRBIRD ADULT RESUSCITATOR WITH SILICONE BAG
- AMBU BABY RESUSCITATOR WITH PAEDI VALVE
- ARGYLE SENTINEL SEAL DUAL CHEST DRAINAGE UNIT
- HEIMLICH VALVE
- HOPE II INFANT RESUSCITATOR
- HOPE III ADULT RESUSCITATOR WITH MIDAS MASK (FORMERLY THE HOPE II)
- INFANT AIRBIRD RESUSCITATOR, P/N 5852, P/N 5852-S
- INFANT SENTRY APNEA ALARM (AEL Model 1500)
- LAERDAL ADULT RESUSCITATOR, CATALOG #870001
- LAERDAL CHILD RESUSCITATOR, CATALOG #860001
- LAERDAL INFANT RESUSCITATOR, CATALOG #850001
- MIGADA UNDERWATER CHEST DRAINAGE UNIT
- OHIO MODEL 885 CONVERSION, ANESTHESIA MACHINE"
- PLEUR-EVAC ADULT-PEDIATRIC, NON-METERED, MODEL A-4000 and PLEUR-EVAC ADULT-PEDIATRIC, METERED, MODEL A-4010
- PLEURA GARD CHEST DRAINAGE SYSTEM
- PURITAN-BENNETT NEBULIZER, MODEL 126055, WITH IMMERSION HEATER
- THORA DRAIN III UNDERWATER CHEST DRAINAGE SYSTEM
- THORA-KLEX CHEST DRAINAGE UNIT 7750 and 7700
- TRAVENOL HEART-LUNG RESUSCITATOR, MODEL HLR 50-90

| ACCEPTABLE | RESPIRATORY |
|---|---|
| **ADULT AMBU RESUSCITATOR WITH E-2 VALVE AND NR VALVE** | **AMBU Inc.**<br>**Hatsboro, PA 19040**<br>**(203) 794-1221** |

**Evaluation Date:** July 1 1978

**Description:** The Air-Shields Adult AMBU Resuscitator provides a safe and effective means fro manual resuscitation during emergency situations. It uses ambient air and/or supplemental oxygen which can be introduced into the unit through the nipple in the center of the NR Valve or through the nipple located on the R Valve with reservoir tube. The AMBU consists of a 2200cc compression bulb, E-2 patient inlet valve whose operation is not affected by vomitus, an NR inlet valve or R inlet valve with reservoir tube, and a transparent face mask with neoprene seal.



**Power Requirements:** None

**Comments:** Results of tests conducted on the unit indicate that it will withstand the stresses of flight without degradation of function. When supplemental oxygen is supplied to the unit, care should be taken to observe the sensitivity of the bag to deflation at flow rates above 10 liters per minute.

| UNACCEPTABLE | RESPIRATORY |
|---|---|
| **AIR-SHIELDS AS 301 TCPCO2 MONITOR** | **Healthdyne**<br>**330 Jacksonville Rd.**<br>**Hatboro, PA 19040**<br>**(215) 675-5200** |
| **Evaluation Date:** August 17 1984 | |

**Description:** Manufacturer's brochure in record.

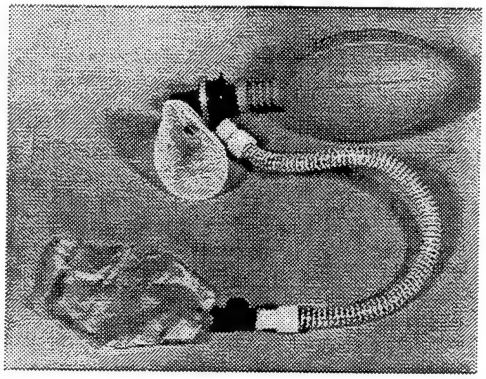
**Power Requirements:** 110 VAC 60 - 400 Hz or Internal battery pack

**Comments:** Failed EMI testing. Testing was terminated, company choose not to fix EMI problems.

| ACCEPTABLE | RESPIRATORY |
|---|---|
| **AIRBIRD ADULT RESUSCITATOR WITH SILICONE BAG** | **Medical Products Division/3M**<br>**P.O. Box 2007**<br>**3101 E. Alejo Rd.**<br>**Palm Springs, CA 92262**<br>**(619) 327-1571** |

**Evaluation Date:** July 1 1978

**Description:** The AIRbird Adult Manual Resuscitator is a self-inflating, manually compressed unit which can be used to deliver ambient or oxygen enriched air to dependent patients.



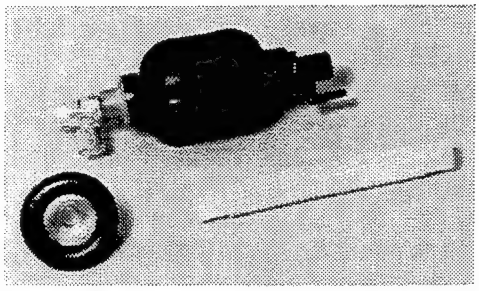
**Power Requirements:** None

**Comments:** Results of tests conducted on the unit indicated that it will withstand the stresses of flight without degradation of function. It should be fully assembled to achieve the highest oxygen concentration when supplemental oxygen is introduced into the unit. Accessory pop-off valve available.

| ACCEPTABLE | RESPIRATORY |
|---|---|
| **AMBU BABY RESUSCITATOR WITH PAEDI VALVE** | **Ambu Inc.**<br>**P.O. Box 1271**<br>**Danbury, CT 06810**<br>**(800) 262-8462** |

**Evaluation Date:** April 1 1976

**Description:** The AMBU Baby Resuscitator with Paedi Valve, Catalog #83019000, is designed for emergency resuscitation of children from prematurity through three years of age. It consists of a self-filling hand-held compression bulb with a Paedi valve assembly. The valve assembly permits forced insufflation of ambient air, or an air/oxygen mixture to be delivered. Accessories included with the basic unit are the inlet valve for supplemental oxygen, the reservoir tube to increase delivered oxygen concentration, the AMBU OA mask, and the carrying case. Standard face masks, adapters, and endotracheal tubes can also be used with the unit.



**Power Requirements:** None

**Comments:** None

CONDITIONAL

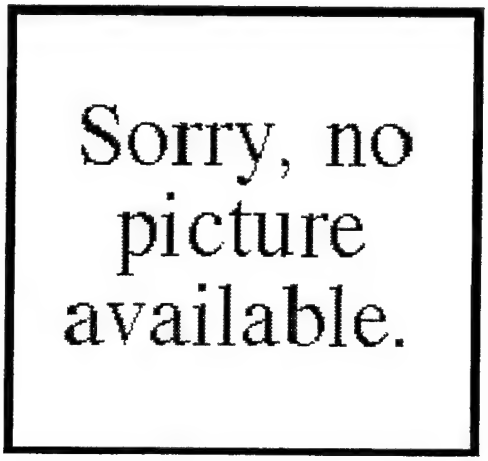
**RESPIRATORY**

# ARGYLE SENTINEL SEAL DUAL CHEST DRAINAGE UNIT

**Sherwood Medical**
**1831 Olive Street**
**St. Louis, MO 63103**
**(800) 527-1806**

**Evaluation Date:** January 1 1989

**Description:** The Argyle is used to remove air and fluid from the patient's pleural cavity; it consists of a collection, water seal, and suction control chamber. Fluid accumulates in the collection chamber while air from the patient's pleural cavity bubbles through the water seal and out of the unit. The water seal separates the patient's collection chamber from the ambient environment. During ascent, air in the collection chamber expands and bubbles out of the unit through the water seal. During descent, a set of check valves prevent cabin air from bubbling backwards through the water seal into the collection chamber.




**Power Requirements:** None

**Comments:** Unit must be used with a Heimlich Valve to prevent cabin air from entering the patient's pleural cavity. For increased patient comfort, ensure that the Heimlich Valve is mounted close to the patient's chest tube. The Argyle has a check valve between the chambers so that water from the water seal chamber does not enter the collection chamber, and water in the patient assessment chamber does not enter the water seal chamber. This unit does not allow any cabin air to enter the collection chamber - but a large negative pressure (approximately 260 cm H20) may develop at the chest tube. The only way to alleviate the negative pressure is to vent the unit manually so that cabin air is allowed to enter the unit. To ensure proper operation, manually vent the unit and readjust the water level in the water seal and suction control chamber as necessary after each landing.

| ACCEPTABLE | RESPIRATORY |
|---|---|
| **HEIMLICH VALVE** | **Bard-Parker Laboratories**<br>**P.O. Box 300**<br>**Lincoln Park, NJ 07035**<br>**(201) 628-9600** |

**Evaluation Date:** June 1 1970

**Description:** The Heimlich Valve is a method of transporting patients with chest tubes to allow egress of air from the chest without allowing ingress of air through the valve.

Sorry, no picture available.

**Power Requirements:** None

**Comments:** This valve is perfectly safe for transport of aeromedical evacuation patient. It must be placed in line between the patient and the underwater sealed chest drainage unit.

# ACCEPTABLE

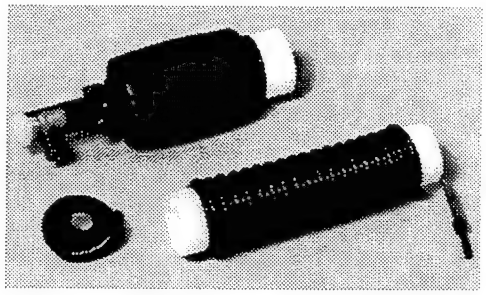
## RESPIRATORY

## HOPE II INFANT RESUSCITATOR

**Ohmeda**
**P.O. Box 7550**
**Madison, WI 53707**
**(800) 345-2700 & (608) 221-1511**

**Evaluation Date:** August 1 1976

**Description:** The Hope II Infant Resuscitator is designed for emergency treatment of infants and children having respiratory difficulty. It is a manually operated unit which consists of a self-inflating compression bulb, a bi-directional ball valve assembly, accumulator tube adapter ring, and an oxygen accumulator relief valve set at 40 cm H2O pressure. The outlet connection of the valve housing will accept either a mask or a 15-mm endotracheal tube connector.

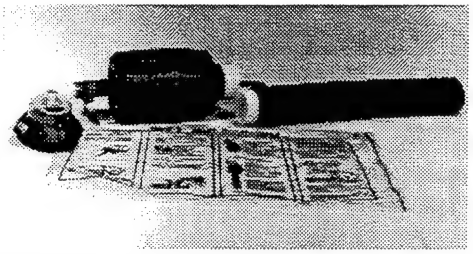


**Power Requirements:** None

**Comments:** The mask is constructed of black, opaque rubber which prevents observation of the mouth and nose during a resuscitative effort. The Hope II Infant Resuscitator is available with or without a magnetic relief valve set at 40 cm H2O pressure. With the valve set at 40 cm H2O pressure, over inflation of the infant's lungs should not occur; however, some infants will require a pressure in excess of 40 cm H2O to adequately inflate their lungs. These factors must be given careful consideration prior to deciding which unit setup (with/without the preset relief valve) is most suited for the intended use.

| ACCEPTABLE | RESPIRATORY |
|---|---|
| **HOPE III ADULT RESUSCITATOR WITH MIDAS MASK (FORMERLY THE HOPE II)** | **Ohmeda**<br>**P.O. Box 7550**<br>**Madison, WI 53707**<br>**(800) 345-2700 & (608) 221-1511** |
| **Evaluation Date:** July 1 1978 | |

**Description:** This device was previously manufactured as the "Hope II". (See Above)



**Power Requirements:** None

**Comments:** Results of tests conducted on the unit indicate it will withstand the stresses of flight without degradation of function. Highest oxygen concentrations are obtained when supplemental oxygen is introduced with the unit fully assembled. The Midas mask should be used as it has a transparent dome. Care must be taken not to crush the accumulator during use as this could create potentially dangerous bag pressures.

# ACCEPTABLE

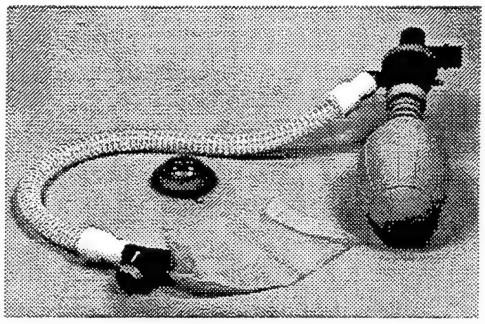
## RESPIRATORY

## INFANT AIRBIRD RESUSCITATOR, P/N 5852, P/N 5852-S

**Medical Products Division/3M**
**P.O. Box 2007**
**3101 E. Alejo Rd.**
**Palm Springs, CA 92262**
**(619) 327-1571**

**Evaluation Date:** November 1 1975

**Description:** The Infant Airbird Resuscitators, P/N 5852 and 5852-S consist of the bulb, breathing valve, reservoir tube, oxygen entrainment valve, and oxygen entrainment bag. The resuscitator, P/N 5852-S has a silicone bulb which provides a good sense or "feel" of pulmonary pressure. Both provide high oxygen concentrations and adequate rates and volumes for neonates, infants, and small children.



**Power Requirements:** None

**Comments:** Results of tests conducted on both (P/N 5852, polyvinyl chloride compression bulb and P/N 5852-S, silicone compression bulb) indicated they could be exposed to rapid decompression and extremes of environment without degradation of materials or malfunction during operation. The silicone compression bulb is designed as the one to use is environmental extremes are anticipated, as silicone is not affected by cold. Both units have the capability to deliver high oxygen concentrations when supplemental oxygen is added to the units. Both should be fully assembled to achieve highest oxygen concentrations. Request the unit with the silicone compression bulb.

# UNACCEPTABLE

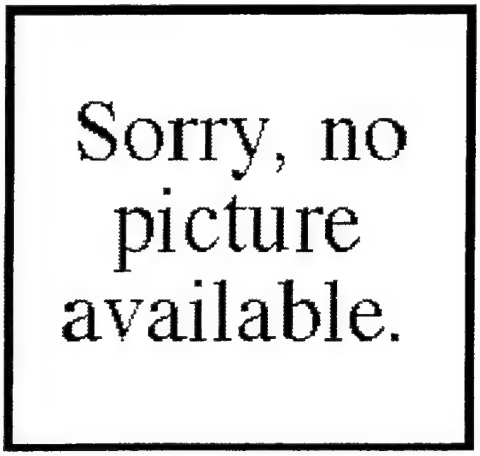
**RESPIRATORY**

## INFANT SENTRY APNEA ALARM (AEL Model 1500)

**American Electronic Laboratories**
**P.O. Box 552**
**Lansdale, PA 19446**
**(215) 822-2929**

**Evaluation Date:** July 24 1972

**Description:** The Infant Sentry system, Model 1500 consists of a control/indicator module, antenna, and a permanent magnet transensor. A small magnet transensor is taped, with non-allergenic tape, to the infant's abdomen near the level of the diaphragm. An antenna is placed underneath the infant and connected to the control/indicator module. Motion caused by the infant's respiration or physical movement will cause the magnetic transensor to move. The control/indicator module senses through the antenna the movement of the transensor, measures the time interval between consecutive motions and alarms if the time interval is greater than the control/indicator time interval setting. The monitored time interval can be set from 3 to 15 seconds in increments of 3 seconds. If the transensor stops moving for a longer period than the preset alarm delay, audible and visual alarms are activated. When the transensor begins moving again, the alarm indicators are reset to a non-alarm condition. Repetitive short alarm periods, therefore, indicate a cyclic breathing/non-breathing condition.




**Power Requirements:** 115 VAC, 50 - 400 Hz or Ni-Cad rechargeable internal battery

**Comments:** Failed Vibration testing.

# ACCEPTABLE

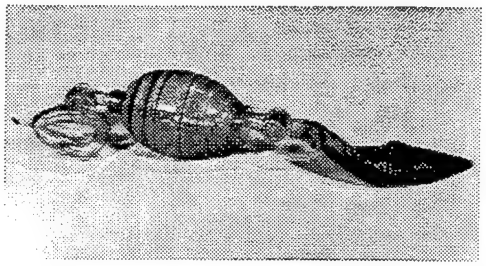
## RESPIRATORY

## LAERDAL ADULT RESUSCITATOR CATALOG #870001

**Laerdal Medical Corporation**
**P.O. Box 190**
**One Labriola CT.**
**Armonk, NY 10504**
**(800) 431-1055**

**Evaluation Date:** July 1 1978

**Description:** The Laerdal Adult Manual Resuscitator provides an effective means to administer artificial breathing when natural respirations are depressed or have ceased.



**Power Requirements:** None

**Comments:** Results of tests conducted on the unit indicate that it will withstand the stresses of flight. Highest oxygen concentrations are achieved when the unit is fully assembled, and supplemental oxygen is introduced at a flow rate of at least 10 liters per minute. When not in use, the bag should be properly folded and stored to prevent possible deformity.

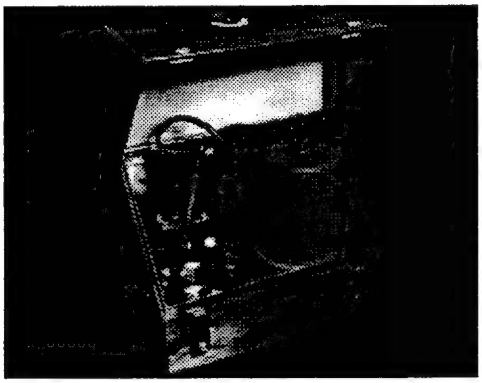
CONDITIONAL

# SUCTION

## AUTOMATIC THERMOTIC ASPIRATORY VACUUM PUMP, MODEL 763 N

**GOMCO Surgical Manufacturing Corp.**
**828 E. Ferry Street**
**Buffalo, NY 14211**
**(716) 894-6678**

**Evaluation Date:** October 1 1974



**Description:** Not available in record

**Power Requirements:** 115 VAC 50 - 400 Hz

**Comments:** The Automatic Thermotic Aspirator Vacuum Pump, modified to include a two-way pressure equalizing valve, is acceptable for use onboard aeromedical evacuation aircraft. Though the pump exceeds radiated and conducted emission limits of MIL-STD-461A, ASD, Wright-Patterson AFB, Ohio, has granted a waiver for this deficiency. The leakage current measured exceeded the 10 microamperes specified by the Association for the Advancement of Medical Instrumentation (AAMI) Subcommittee on Electrical Safety. The pump, therefore, should not be used on or near an electrically susceptible patient (one with probes, catheters, or other nonconductive paths from outside the body into the thorax). ASC/ENACE, Wright-Patterson AFB, Ohio, has granted EMC waiver for this unit.

# ACCEPTABLE

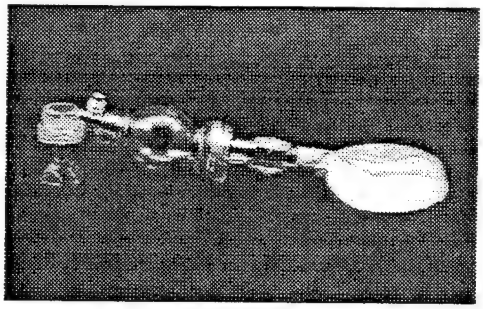
## RESPIRATORY

## LAERDAL INFANT RESUSCITATOR CATALOG #850001

**Laerdal Medical Corporation**
**P.O. Box 190**
**One Labriola CT.**
**Armonk, NY 10504**
**(800) 431-1055**

**Evaluation Date:** November 1 1978

**Description:** The Laerdal Infant Resuscitator provides the capability to manually resuscitate premature infant through children 2 years of age. The safety valve prevents delivery of pressure in excess of 35 cm of water, unless higher pressures are required and delivered by holding the valve in a closed position.



**Power Requirements:** None

**Comments:** Completely assembled and with a supplemental oxygen flow rate of 10 liters per minute, oxygen concentrations of 95 to 99% are attainable.

CONDITIONAL

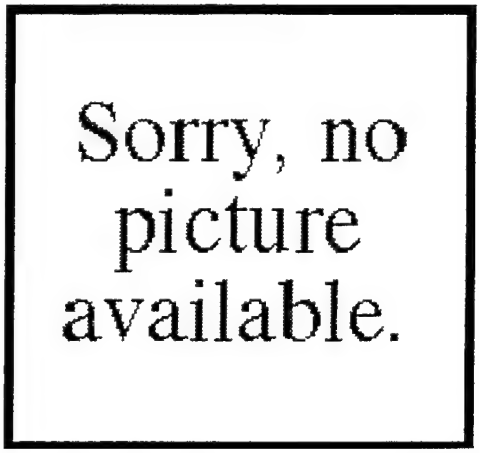
**RESPIRATORY**

# MIGADA UNDERWATER CHEST DRAINAGE UNIT

**Migada, Inc.**
**150 E. Olive Ave, Suite 215**
**Burbank, CA 91502**
**(818) 848-3880**

**Evaluation Date:** January 1 1989

**Description:** The Migada was designed as an emergency treatment device for removing air and fluids from a patient's pleural cavity under field conditions. It consists of two connected collection chambers with the water seal incorporated within the first. Air and fluids both drain through the water seal; fluid accumulates in the collection chamber while air bubbles go through the water seal and flow out of the unit. The water seal separates the patient from the ambient environment. During ascent, air in the drainage tube expands and bubbles out of the unit through the water seal. During descent, cabin air pushes the fluid within the collection chamber back up the drainage tube towards the patient; cabin air may also bubble into the drainage tube. Use of a Heimlich Valve protects the patient from the possible deleterious effects of dirty cabin air and increasing cabin air pressure.



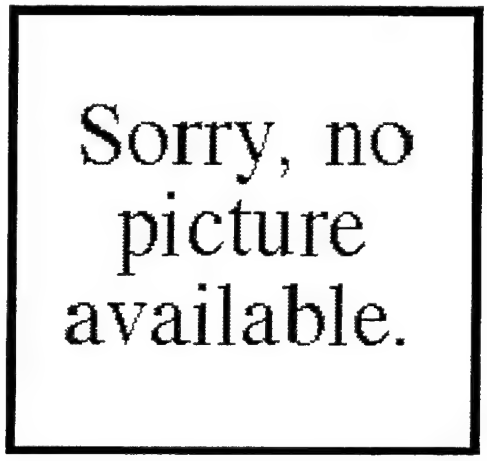

**Power Requirements:** None

**Comments:** Because fluids from the collection chamber will travel up the drainage tube during descent, ensure that the Migada is located well below the patient to prevent complications from the fluid backing into the Heimlich Valve. **This unit must be used with a Heimlich Valve.** Place Heimlich Valve close to the patient's chest tube. **Migada does NOT have suction control capability.** Suction applied to the patient must be regulated at the suction source.

| ACCEPTABLE | RESPIRATORY |
|---|---|
| **OHIO MODEL 885 CONVERSION, ANESTHESIA MACHINE** | **Ohio Medical Products**<br>**Ohmeda Dr.**<br>**P.O. Box 7550**<br>**Madison, WI 53707-7550**<br>**(608) 221-1551** |

**Evaluation Date:** January 31 1986

**Description:** Not available in record




**Power Requirements:** O2 Source

**Comments:** The Ohio Model 885 conversion, anesthesia machine easily connects to the PTLOX with no additional connectors or adapters required. A single anesthesia machine can be operated from the PTLOX. Flow testing indicates that at least three anesthesia machines can be operated from a single PTLOX simultaneously. This conclusion is drawn from device flow requirements and actual measurements and observations by Aeromedical Research personnel utilizing one anesthesia machine and two flowmeters (simulated anesthesia machines). It should be noted that if the flush function is operated for prolonged periods of time (greater than two minutes), the oxygen temperature from the PTLOX outlet may drop more than 20 degrees F (-6.6 degrees C) below ambient temperature. Since the anesthesia machine's flush function is used only momentarily during normal operation, no significant temperature decrease should be expected.

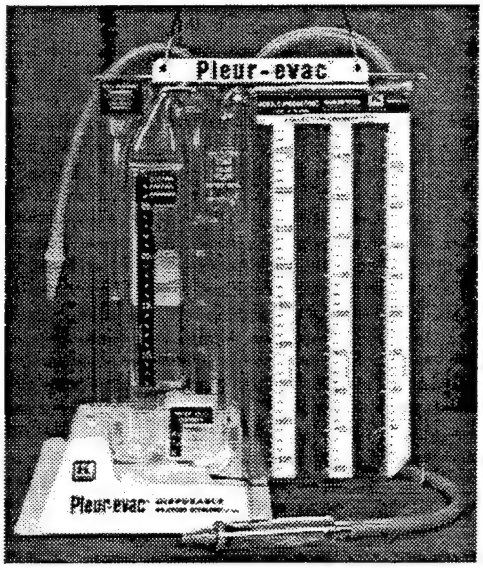
CONDITIONAL

# RESPIRATORY

# PLEUR-EVAC ADULT-PEDIATRIC, NON-METERED MODEL A-4000 ADULT-PEDIATRIC, METERED, MODEL A-4010

**Howmedica, Inc.**
**(Deknatel Division)**
**Krale Laboratories**
**Queens Village, NY 11429**
**(516) 488-5400**

**Evaluation Date:** October 1 1975




**Description:** Not available in record

**Power Requirements:** None

**Comments: MUST be used with a Heimlich Valve.** Both models were tested and found acceptable only when Heimlich Valves are used concurrently. The units are not acceptable for use without Heimlich Valves. The Heimlich Valve is placed in line between the patient and the unit. The valve will protect the patient against pneumothorax if the air evacuating unit becomes nonfunctional or the integrity of the system is lost.

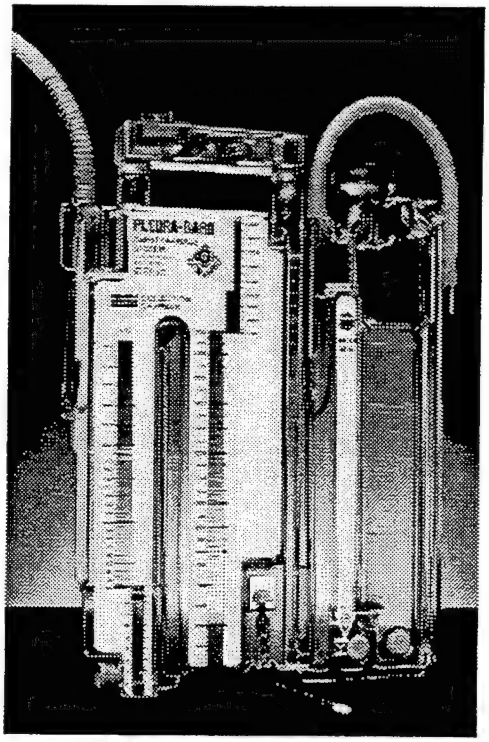
CONDITIONAL

**RESPIRATORY**

# PLEURA GARD CHEST DRAINAGE SYSTEM

**ConMed Corp.**
**310 Broad Street**
**Utica, NY 13501**
**(800) 448-6506**

**Evaluation Date:** January 1 1989



**Description:** The Pleura Gard is used to remove air and fluid from the patient's pleural cavity; it consists of collection, water seal, and suction control chambers. Fluid accumulates in the collection chamber while air from the patient's pleural cavity bubbles through the water seal and out of the unit. The water seal separates the patient's collection chamber from the ambient environment. During ascent, air in the collection chamber expands and bubbles out of the unit through the water seal. During descent, cabin air bubbles backwards through the water seal into the collection chamber. Use of a Heimlich Valve protects the patient from the possible deleterious effects of dirty cabin air.

**Power Requirements:** None

**Comments: Must be used with a Heimlich Valve.** For patient comfort, ensure valve is mounted close to the patient's chest tube. During ascent and descent the changing cabin air pressure forces the water levels to move between the different chambers of the unit. To ensure proper operation, readjust the water level in the water seal and suction control chamber as necessary after each landing. During descent, water from the water seal chamber will move into the collection chamber. This will dilute the patient's fluids which have accumulated and this additional fluid must be accounted for when measuring the patient's output.

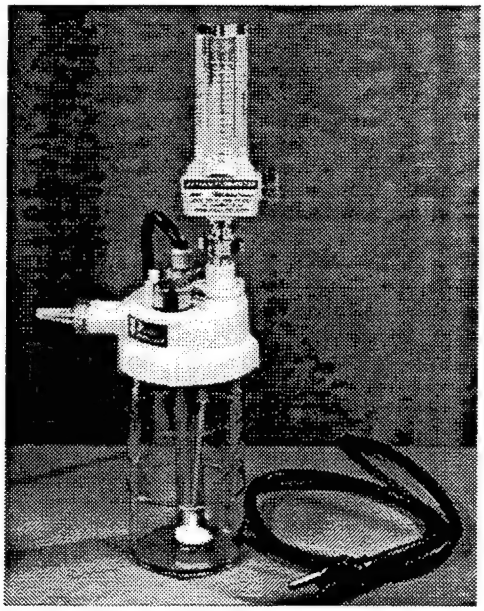
# UNACCEPTABLE

## RESPIRATORY

## PURITAN-BENNETT NEBULIZER, MODEL 126055, WITH IMMERSION HEATER

**Puritan-Bennett Corporation**
**Oak at Thirteenth**
**Kansas City, MO 64106**

**Evaluation Date:** December 1 1974



**Description:** Not available in record

**Power Requirements:** 115 VAC 60 Hz

**Comments:** Failed EMI testing. The Bennett Nebulizer has a thermostat that turns the heater on and off approximately once every 5 minutes. When the thermostat turns on or off a pulse is generated that exceeds both the radiated and conducted emission limits specified by MIL-STD-461A. Leakage current is less than one micro-ampere. No attempt was made to measure the resistance of the power cable 3d wire ground. Thermostat setting does not significantly change the timing of the on/off cycle.

CONDITIONAL

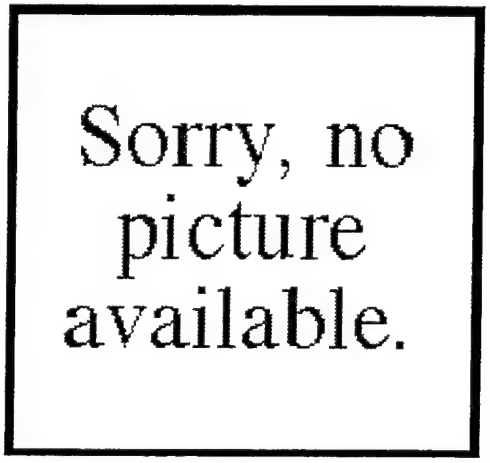
**RESPIRATORY**

# THORA DRAIN III UNDERWATER CHEST DRAINAGE SYSTEM

**Sherwood Medical Co.**
**1831 Olive Street**
**St. Louis, MO 63103**
**(800) 527-1806 or (800) 392-5859 - Missouri only**

**Evaluation Date:** January 1 1989

**Description:** The Thora Drain III is used to remove air and fluid from the patient's pleural cavity; it consists of a collection, water seal, and suction control chamber. Fluid accumulates in the collection chamber while air from the patient's pleural cavity bubbles through the water seal and out of the unit. The water seal separates the patient's collection chamber from the ambient environment. During ascent, air in the collection chamber expands and bubbles out of the unit through the water seal. During descent, cabin air bubbles backwards through the water seal into the collection chamber. Use of the Heimlich Valve protects the patient from the possible deleterious effects of dirty cabin air.




**Power Requirements:** None

**Comments: This unit must be used with a Heimlich Valve.** For patient comfort, ensure the valve is mounted close to the patient's chest tube. During ascent and descent the changing cabin air pressure forces the water levels to move between the different chambers of the unit. To ensure proper operation, readjust the water level in the water seal and suction control chamber as necessary after each landing.

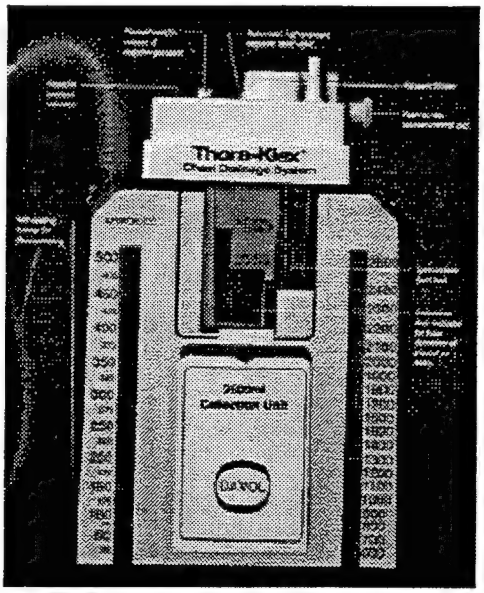
CONDITIONAL

# RESPIRATORY

## THORA-KLEX CHEST DRAINAGE UNIT 7750 and 7700

**Davol Inc.**
**Div CR Bard Inc.**
**P.O. Box 8500**
**Cranston, RI 02920**
**(800) 556-6275**

**Evaluation Date:** January 1 1989



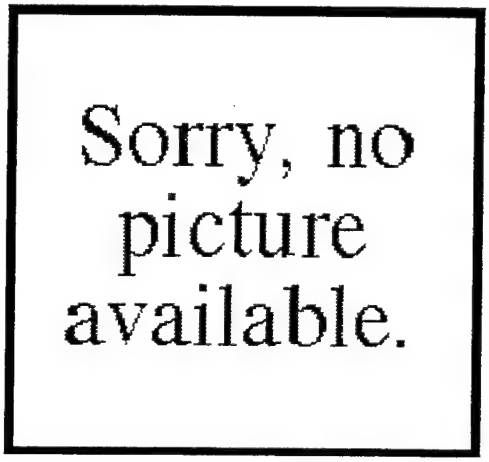

**Description:** The Thora-Klex is used to remove air and fluid from the patient's pleural cavity; it consists of a collection, water seal, and suction control chamber. Fluid accumulates in the collection chamber while air from the patient's pleural cavity bubbles through the water seal and out of the unit. The water seal separates the patient's collection chamber from the ambient environment. During ascent, air in the collection chamber expands and bubbles out of the unit through the water seal. During descent, cabin air bubbles backwards through the water seal into the collection chamber. Use of a Heimlich Valve protects the patient from the possible deleterious effects of dirty cabin air.

**Power Requirements:** None

**Comments: This unit must be used with a Heimlich Valve.** For patient comfort, ensure the valve is mounted close to the patient's chest tube. During ascent and descent the changing cabin air pressure forces the water levels to move between the different chambers of the unit. To ensure proper operation, readjust the water level in the water seal chamber as necessary after each landing. The water seal chamber can only be filled using a needle and syringe. Suction applied to the patient is adjusted by turning a "thumb screw". Suction can be accurately delivered, but the "thumb screw" is affected by aircraft vibrations so that the applied suction will vary between 8 and 41 cm H20 negative pressure throughout the flight. Unit product code changed, evaluated new device and found acceptable for use 10/93. See record for letter.

| ACCEPTABLE | RESPIRATORY |
| --- | --- |
| **TRAVENOL HEART-LUNG RESUSCITATOR, MODEL HLR 50-90** | **Manufacturer Unknown** |
| **Evaluation Date:** January 1 1968 | |

**Description:** Not available in record




**Power Requirements:** Not recorded

**Comments:** Care must be taken to assure proper placement.

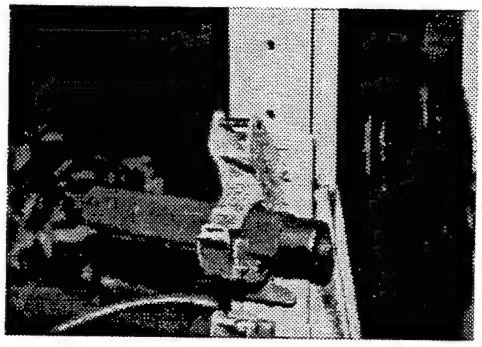
# AEROMEDICAL RESEARCH STATUS GUIDE

## SECURING

- AEROMEDICAL POLE
- CLINICAL RECORDS RACK
- HORTON BRACKET
- INFLIGHT INTRAVENOUS BOTTLE HOLDER
- LITTER EQUIPMENT SUPPORT DEVICE
- LITTER/STRYKER FRAME RESPIRATOR MOUNT
- MULTIPURPOSE AEROMEDICAL TRAY HOLDER
- NEONATAL TRANSPORT SYSTEM (NTS) C-21 SECURING PLATE
- NEONATAL TRANSPORT SYSTEM (NTS) WOODEN SUPPORT BLOCK
- PEDIATRIC SAFETY NET
- WATERS BRACKET

| ACCEPTABLE | SECURING DEVICES |
|---|---|
| AEROMEDICAL POLE | Local Fabrication. |
| **Evaluation Date:** April 1 1990 | |

**Description:** This pole, 22.86 cm (9 inches) long and 3.18 cm (1 -1/4 inches) in diameter and made of aluminum, is used for mounting and securing medical equipment on aeromedical evacuation aircraft. It is designed to securely fit into the stanchion litter clamps on the C-130 and C-141B aircraft, as well as into the clamps of the cantilever arms on the C-9A aircraft. When so secured, medical equipment items with securing devices designed to fit the NATO litter pole can be mounted to the device.



**Power Requirements:** None

**Comments:** The device works well for mounting several pieces of recently approved aeromedical evacuation equipment, such as the MiniOX III Oxygen Monitor, the Biochem 1040A Pulse Oximeter, and the MTP Infusion Pump. Contract specifications required that those items' mounting devices fit the NATO litter pole. Often, items fitted for the litter pole will fit nothing else on the aircraft. Mounted on a litter pole the items protrude into the aisle of the crowded aircraft, presenting a safety hazard. Using the securing pole is a vast improvement. Installing the pole on the stanchions of the C-130 and C-141B and mounting the equipment on the pole, eliminates the hazard. Visibility is also improved, as the items can be mounted higher on the stanchion. The same method can be employed on the C-9A. A cantilever arm must be dedicated for the pole and equipment item, with the cantilever arm placed at a level close to the patient's litter.

**Design plans can be obtained from the Aeromedical Research, Armstrong Laboratory/CFTS, Brooks AFB, TX 78235-5301.**

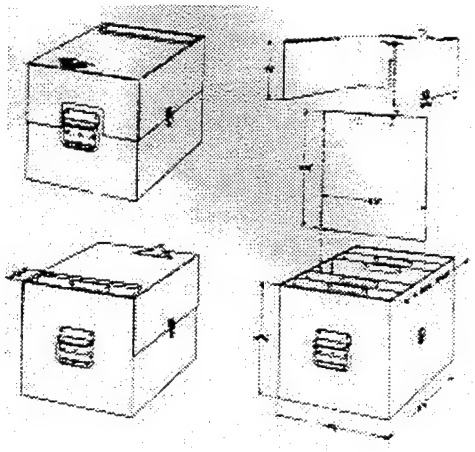
# ACCEPTABLE

## SECURING DEVICES

## CLINICAL RECORDS RACK

**Local Fabrication**

**Evaluation Date:** August 1 1974



**Description:** The clinical records rack was designed to provide a portable, durable, lightweight, compartmentalized unit that will enhance handling, organization, and storing of patient records during aeromedical evacuation.

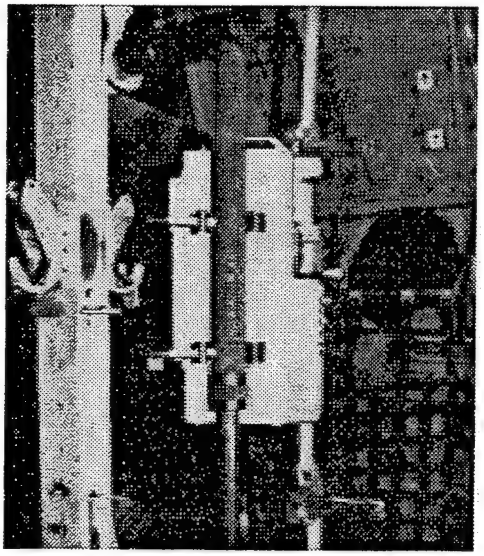
**Power Requirements:** None

**Comments:** A list of parts is contained in Report SAM-TR-74-62, Clinical Records Rack for Tactical Aeromedical Airlift Nov. 74. This technical report can be obtained by writing or telephoning: **U.S. Department of Commerce**
**(National Technical Information Service)**
**5285 Port Royal Road**
**Springfield, VA 22161**
**(703) 487-4650**

| ACCEPTABLE | SECURING DEVICES |
|---|---|
| **HORTON BRACKET** | **Local Fabrication.** |

**Evaluation Date:** September 1 1991

**Description:** This C-shaped bracket was designed to be mounted vertically, with each end secured to 2 in-place litter pole handles; or to the litter stanchion, (with adapter poles to interface between the bracket and litter clamps or cantilever arms.) The bracket is hollow and made of aluminum, although earlier versions fabricated by the 9th Aeromedical Evacuation Squadron in the Pacific Theater were made of stainless steel. The length is adjustable, to accommodate the variable distance between litters, but the minimum length is 19 in., to allow horizontal mounting on the end of one litter. The Baby Bird infant ventilator, IMED 928 infusion pump, MiniOX III oxygen monitor, Biochem 1040A pulse oximeter, MTP 1001a infusion pump and other items may be mounted on the Horton Bracket.



**Power Requirements:** None

**Comments: Design plans can be obtained from the Aeromedical Research, Armstrong Laboratory/CFTS, Brooks AFB, TX 78235-5301.**

| ACCEPTABLE | SECURING DEVICES |
|---|---|
| **INFLIGHT INTRAVENOUS BOTTLE HOLDER** | **Local Fabrication.** |

**Evaluation Date:** December 1 1972

**Description:** The inflight Intravenous Bottle Holder is an inverted "T"-shaped aluminum assembly with slotted flanges at each end. There is a steel hook near the top to attach the hanger of an I. V. container and a padded horizontal cradle assembly with attached web/velcro straps near the bottom. Weighs 3.3 oz.

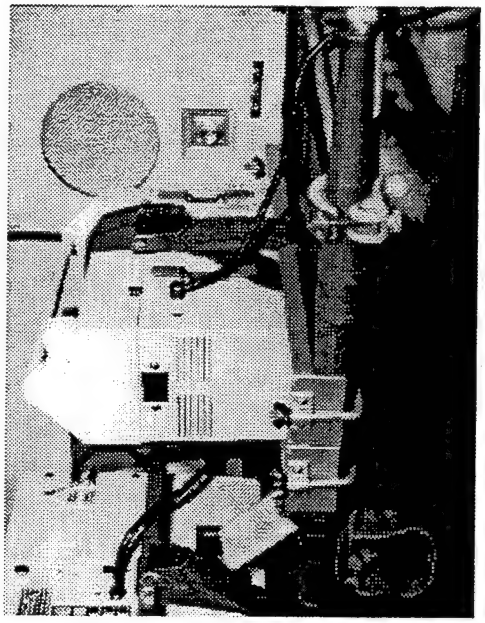
**Power Requirements:** None

**Comments:** The inflight intravenous bottle holder was found to be a practical, safe, and rapid method of securing intravenous solutions during aeromedical evacuation.

**Drawings are on file at the Engineering Center 2750 ABW/EDDR, Wright-Patterson AFB, Ohio. No. 721220 - Bottle Holder Assembly**

| ACCEPTABLE | SECURING DEVICES |
|---|---|
| **LITTER EQUIPMENT SUPPORT DEVICE** | **Local Fabrication** |

**Evaluation Date:** February 1 1975



**Description:** Not available in record

**Power Requirements:** None

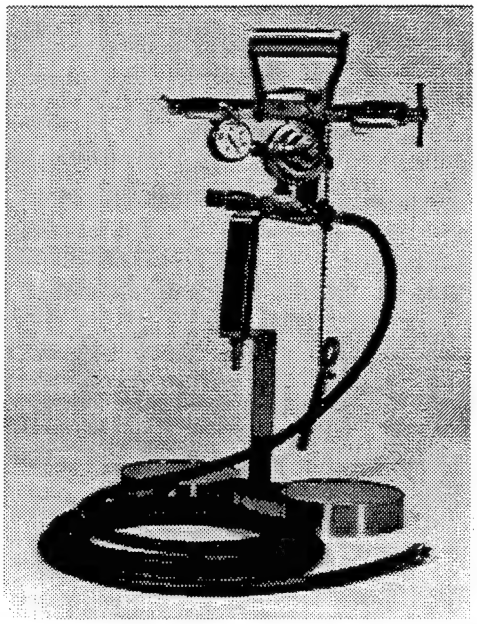
**Comments:** The device has proven, during feasibility testing, to be a versatile aid to securing most of the medical equipment items presently secured on an empty patient litter, e.g., incubator, battery pack, patient monitor, defibrillator, etc.

**Engineering drawings are on file at Aeromedical Research, Brooks AFB, TX 78235. The drawing number and nomenclature are as follows: No. SAM 75D3 - Assembly & Details Equipment Support Device, Litter**

| ACCEPTABLE | SECURING DEVICES |
|---|---|
| **LITTER/STRYKER FRAME RESPIRATOR MOUNT OXYGEN PACK FOR SIZE "D" OR "E" TANKS** | **Contract** |

**Evaluation Date:** December 1 1975

**Description:** The Litter/Stryker Frame Respirator Mount was designed as a lightweight device to be used on a Stryker Frame or on a standard NATO litter to support and restrain the Bird Mark 10 - 14 Respirator during aeromedical airlift. The bird respirator is the most frequently used instrument to provide respiratory support to patients requiring this service during aeromedical airlift. A high pressure (1800 psi), modified oxygen pack is also provided as a complimentary part of the respirator mount. The Oxygen pack consists of an oxygen tank carrier with pressure cylinder attachments for size "D" or "E" tanks with a pressure regulation gauge, an oxygen connecting line, a carrying handle, and an oxygen cylinder wrench.



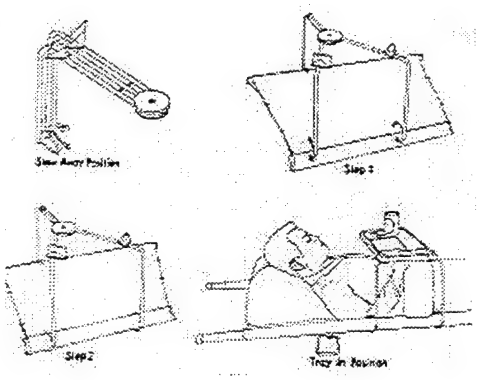
**Power Requirements:** None

**Comments:** The device works will for mounting several pieces of recently approved aeromedical evacuation equipment, such as the MiniOX III Oxygen Monitor, the Biochem 1040A Pulse Oximeter, and the MTP Infusion Pump. Contract specifications required that items' mounting devices fit the NATO litter pole. Often, items fitted for the litter pole will fit nothing else on the aircraft. Mounted on a litter pole, the items protrude into the aisle of the crowded aircraft, presenting a safety hazard. Using this device is a vast improvement. Installing the bracket on the stanchions of the C-9 and C-141B and mounting the equipment on the pole, eliminates the hazard. Visibility is also improved, as the items can be mounted higher on the stanchion. This bracket will NOT accommodate the C-130 litter stanchion.

| ACCEPTABLE | SECURING DEVICES |
|---|---|
| **MULTIPURPOSE AEROMEDICAL TRAY HOLDER** | **Local Fabrication.** |

**Evaluation Date:** June 1 1973

**Description:** The Tray Holder is a modified tripod with 3/8" tubular stainless steel tray support rods and legs. The legs have contoured stainless steel clamps which fit around the litter poles to provide positive attachment. The legs and tray support rods are attached to an anodized aluminum disc which provides a pivot assembly for collapsing the device for storage. Stainless steel tray clips are welded on two of the support rods to secure two corners of the tray. An adjustable spring loaded tray clip is incorporated in the other support rod to facilitate insertion and removal of the tray and to secure one end of the tray in the holder during use.



**Power Requirements:** None

**Comments:** The Multipurpose Aeromedical Tray Holder meets the design and performance specifications and fulfills the development objective.

**Engineering drawings for the holder are on file at the Engineering Data Center, 2750 ABW/EDDR, Wright-Patterson AFB, Ohio. No. 7150201 - Multipurpose Aeromedical Tray Holder General Assembly.**

| ACCEPTABLE | SECURING DEVICES |
|---|---|
| **NEONATAL TRANSPORT SYSTEM (NTS) C-21 SECURING PLATE** | **Local Fabrication** |

**Evaluation Date:** April 1 1990

**Description:** The plate, made of angle iron, measures 8.64 cm (3.40 inches) (L) x 6.60 cm (2.60 inches) (w) x 1.3 cm (0.50 inches) (t) when assembled. When attached to the aircraft seat-rails, four of them are used to secure the NTS to the floor of the C-21. Cargo tie-down straps are clipped to the NTS, and the ratchet ends are hooked to the plates and tightened.

Sorry, no picture available.

**Power Requirements:** None

**Comments:** The plate is an effective device for securing the NTS to the C-21 aircraft. The plates should be used in tandem with wooden support blocks to lift the front of the NTS off the aircraft floor, and standard aircraft seat stops placed between the NTS and each rear plate, adjacent to the plate. Extra care should be taken to avoid overtightening the cargo tie-down straps.

**Design plans included in USAFSAM-TR-90-23. Follow securing procedures described in USAFSAM-TR-90-23, Testing and Evaluation of the International Biomedical Inc. Neonatal Transport System available through the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Rd., Springfield VA 22161. Telephone: (703) 487-4650.**

# ACCEPTABLE

## SECURING DEVICES

## NEONATAL TRANSPORT SYSTEM (NTS) WOODEN SUPPORT BLOCK

**Local Fabrication**

**Evaluation Date:** April 1 1990

**Description:** The block, made of hard wood, measures 10.16 cm (4.0 inches) (L) x 10.16 cm (4.0 inches) (w) x 14.73 cm (5.8 inches) (h), with a 2.54 cm (1 inch) x 2.54 cm (1 inch) groove across the top to accommodate the NTS lower frame. When a set of blocks are placed under the frame, they suspend the NTS approximately 1/4 inch off the floor of the aircraft.

Sorry, no picture available.

**Power Requirements:** None

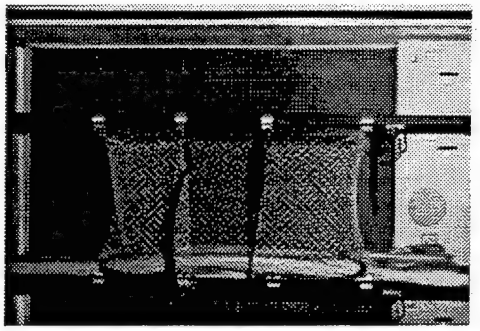
**Comments:** The block is an effective device for providing the weight distribution, when securing the NTS on aeromedical aircraft. Without the blocks all the weight, over 200 pounds, is distributed among the four wheels, with each wheel applying over 50 psi to the floor of the aircraft; before tightening the cargo tie-down straps. With the blocks, the weight is more evenly distributed to slightly over 3 psi, before tightening. An added advantage is that there is no stress applied to the NTS wheels, as they are suspended 1/4 inch above the floor. On the C-9 and C-141 aircraft, four blocks are needed; two for the front and two for the rear. On the C-21, two blocks are needed for the front only. The rear frame, with the wheels removed, rests on a four-inch ledge that runs the length of the cabin.

**Design plans included in USAFSAM-TR-90-23. Follow securing procedures described in USAFSAM-TR-90-23, Testing and Evaluation of the International Biomedical Inc. Neonatal Transport System, available through the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Rd., Springfield VA 22161. Telephone: (703) 487-4650.**

| ACCEPTABLE | SECURING DEVICES |
|---|---|
| PEDIATRIC SAFETY NET | Contract |

**Evaluation Date:** August 1 1976

**Description:** Not available in record

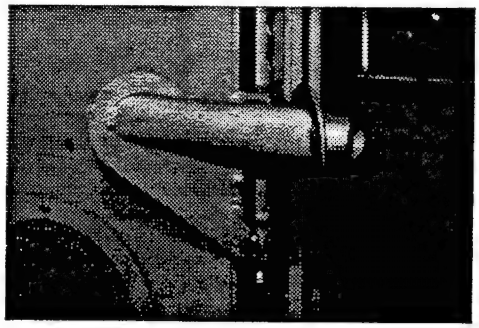


**Power Requirements:** None

**Comments:** The safety net is an added safety feature and does not remove the requirement for the child to be secured to the litter with two litter straps. No further information in file.

| ACCEPTABLE | SECURING DEVICES |
|---|---|
| **WATERS BRACKET** | **Local Fabrication.** |
| **Evaluation Date:** April 1 1990 | |

**Description:** This device, with overall dimensions of 20.32 cm (8 inches) wide x 17.15 cm (6 - 3/4 inches) high x 12.70 cm (5 inches) deep, and made of aluminum, is used for mounting and securing medical equipment aboard aeromedical evacuation aircraft. This device consists of the Aeromedical Equipment Securing Pole, welded into a butterfly shaped bracket which can be secured into the litter stanchion pole track on both the C-9A and C-141B. The bracket locks into the track utilizing a locking mechanism similar to that on the C-9A litter cantilever arm.



**Power Requirements:** None

**Comments:** The device works will for mounting several pieces of recently approved aeromedical evacuation equipment, such as the MiniOX III Oxygen Monitor, the Biochem 1040A Pulse Oximeter, and the MTP Infusion Pump. Contract specifications required that items' mounting devices fit the NATO litter pole. Often, items fitted for the litter pole will fit nothing else on the aircraft. Mounted on a litter pole, the items protrude into the aisle of the crowded aircraft, presenting a safety hazard. Using this device is a vast improvement. Installing the bracket on the stanchions of the C-9 and C-141B and mounting the equipment on the pole, eliminates the hazard. Visibility is also improved, as the items can be mounted higher on the stanchion. This bracket will NOT accommodate the C-130 litter stanchion.

**Design plans can be obtained from the Aeromedical Research, Armstrong Laboratory/CFTS, Brooks AFB, TX 78235-5301.**


# AEROMEDICAL RESEARCH STATUS GUIDE


## SUCTION

- AUTOMATIC THERMOTIC ASPIRATORY VACUUM PUMP, MODEL 763 N
- GOMCO ASPIRATOR PORTABLE PUMP, MODEL 789
- GOMCO MODEL 6003/6053 ASPIRATORS
- IMPACT 308M INTERMITTENT SUCTION TIMER-BOX AND THREE-WAY MANIFOLD
- IMPACT MODEL 302 PORTABLE ASPIRATOR
- IMPACT MODEL 305GR PORTABLE ASPIRATOR
- IMPACT MODEL 306 ASPIRATOR
- IMPACT MODEL 308M PORTABLE ASPIRATOR
- LAERDAL SUCTION UNIT, MODEL LSU
- LAERDAL SUCTION UNIT, TRANSFORMER/RECTIFIER
- MEDICAL MULTIPURPOSE SUCTION PUMP (SUNDSTRAND) MODEI 77-500
- MUELLER ASPIRATOR PUMP (CARMODY)
- OHIO INTERMITTENT SUCTION UNIT, CATALOG #6704-1251-901
- PORTABLE TRACHEAL ASPIRATOR (PROTOTYPE)
- RICO MODEL RS-6 FIXED/PORTABLE SUCTION SYSTEM
- S-SCOR PORTABLE SUCTION
- SAM MULTIPURPOSE VACUUM PUMP (SMVP)

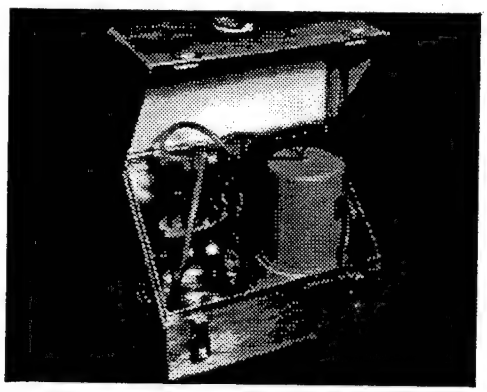
CONDITIONAL

# SUCTION

## AUTOMATIC THERMOTIC ASPIRATORY VACUUM PUMP, MODEL 763 N

**GOMCO Surgical Manufacturing Corp.**
**828 E. Ferry Street**
**Buffalo, NY 14211**
**(716) 894-6678**

**Evaluation Date:** October 1 1974



**Description:** Not available in record

**Power Requirements:** 115 VAC 50 - 400 Hz

**Comments:** The Automatic Thermotic Aspirator Vacuum Pump, modified to include a two-way pressure equalizing valve, is acceptable for use onboard aeromedical evacuation aircraft. Though the pump exceeds radiated and conducted emission limits of MIL-STD-461A, ASD, Wright-Patterson AFB, Ohio, has granted a waiver for this deficiency. The leakage current measured exceeded the 10 microamperes specified by the Association for the Advancement of Medical Instrumentation (AAMI) Subcommittee on Electrical Safety. The pump, therefore, should not be used on or near an electrically susceptible patient (one with probes, catheters, or other nonconductive paths from outside the body into the thorax). ASC/ENACE, Wright-Patterson AFB, Ohio, has granted EMC waiver for this unit.

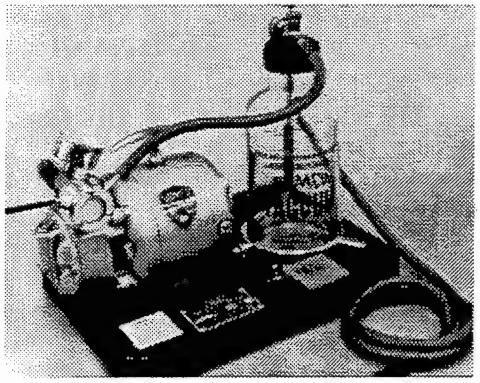
CONDITIONAL

# SUCTION

## GOMCO ASPIRATOR PORTABLE PUMP, MODEL 789

**GOMCO Surgical Manufacturing Corp.**
**828 E. Ferry Street**
**Buffalo, NY 14211**
**(716) 894-6678**

**Evaluation Date:** October 1 1974



**Description:** The GOMCO Aspirators are compact units that occupy less than one square foot of table space. The light weight portable model may be easily carried to point-of-use.

**Power Requirements:** 24 - 28 VDC

**Comments:** The unit was tested for suitability for use onboard aeromedical evacuation aircraft. The pump consists of a 24 VDC motor, rotary compressor pump, safety overflow valve, vacuum gauge, vacuum regulating valve, and fluid container. The unit passed all environmental tests though it exceeds EMI. ASC/ENACE, Wright-Patterson AFB, Ohio has granted a waiver for this unit.

| UNACCEPTABLE | SUCTION |
|---|---|
| **GOMCO MODEL 6003/6053 ASPIRATORS** | **Allied Healthcare Products, Inc. (GOMCO Division) 1720 Sublette Ave. St. Louis, MO 63110 (314) 771-1242** |
| **Evaluation Date:** April 23 1991 | |

**Description:** Not available in record

Sorry, no picture available.

**Power Requirements:** Not recorded

**Comments:** Failed EMI testing. Size a limiting factor. Securing on A/C problem.

CONDITIONAL

**SUCTION**

# IMPACT 308M INTERMITTENT SUCTION TIMER-BOX AND THREE-WAY MANIFOLD

**Impact Instrumentation, Inc.**
**P.O. Box 508**
**West Caldwell, NJ 07006**
**(800) 882-1212**

**Evaluation Date:** March 1 1991

**Description:** The intermittent suction timer-box and three-way manifold are attachments that adapt to the Impact 308M suction unit to provide intermittent suction to 3 suction canister setups, theoretically for 3 patients. The timer-box is basically a two-outlet receptacle box. One receptacle provides 120 volts alternating current (VAC); while the second receptacle provides 120 VAC cycling on every minute for 15 seconds, and off for 45 seconds. The three-way manifold, which is mounted on a board and sits adjacent to the 308M suction device, will replace the standard manifold of the 308M suction device. It has an adjustable pressure gauge, which measures the negative pressure to the 3 suction canister setups.

Sorry, no picture available.

**Power Requirements:** 120 VAC 60 - 400 Hz

**Comments: The Impact 308M can only be operated for 27 minutes of continuous operation before it must be shut off due to over heating.**

The following requirements must be met when using this setup:

1. The box shall only be used with a 308M suction unit that has a 250 VAC/3 Amp slow-blow fuse installed in the input power circuit.

2. The main vacuum control knob tends to spontaneously move, due to vibration. It is essential that each of the 3 suction setups be monitored for degradation of suction.

# UNACCEPTABLE

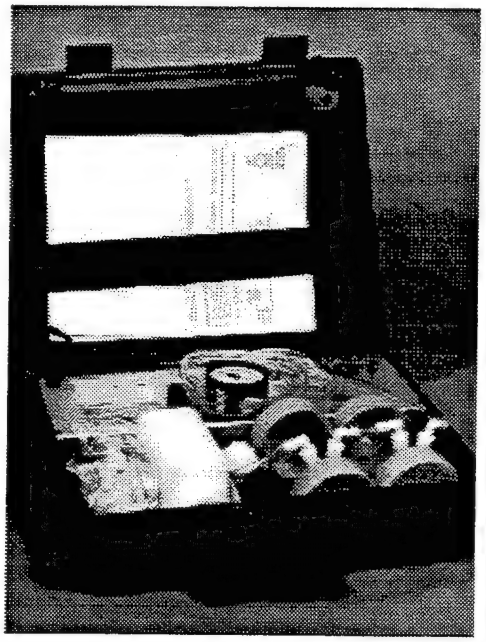
## SUCTION

## IMPACT MODEL 302 PORTABLE ASPIRATOR

**Impact Instrumentation, Inc.**
**P.O. Box 508**
**West Caldwell, NJ 07006**
**(800) 882-1212**

**Evaluation Date:** October 19 1979

**Description:** Rechargeable batteries that provide up to one hour of continuous use at maximum vacuum. Supplementing the rechargeable batteries is AC and DC operation, the Model 302 recharges as it operates. A suction regulator control permits complete ranging of vacuum from 0 to 510 mm/hg. Dual collection jars feature an overflow shut-off system which prevents aspirated contents from being drawn into the suction system. This system operates regardless of aspirator positioning - upright or lying down, and also provides bacterial filtration to protect the user from environmental contamination. Other standard features include - separate power and charge indicator lamps, 5 ft. clear vacuum hose, catheters, airways "Y" connector, automotive charger cable, AC charger and suction rinsing bottle. All conveniently stored within a rugged polyethylene case which is dent, shatter and scuff proof.



**Power Requirements:** 117 VAC 60 Hz or 12 VDC

**Comments:** Failed EMI testing.

CONDITIONAL

# SUCTION

# IMPACT MODEL 305GR PORTABLE ASPIRATOR

**Impact Instrumentation, Inc.**
**P.O. Box 508**
**West Caldwell, NJ 07006**
**(800) 882-1212**

**Evaluation Date:** October 1 1985

**Description:** The Impact Model 305 GR is a portable aspirator capable of both oropharyngeal and tracheal suctioning. It is lightweight and comes enclosed in a self-contained polyethylene carrying case. The vacuum can be adjusted from 0 to 550 mmHg. The Model 305GR is similar to the Impact Model 308M Portable Aspirator. The major difference between the models is that the 308M has an internal transformer/rectifier for operation on 110 VAC 50 - 400 Hz.

**Power Requirements:** 120 VAC - 60 Hz, 0.4 amp (Only tested and approved charger is P/N 810-0001-00), Internal rechargeable battery or External 12 VDC

**Comments:** Users should be instructed to keep the lid of the Impact open at all times when the unit is being used. A potential electrical hazard exists if the aspirate canister overflows from the exhaust port when the lid is closed. This warning will be stated in the operator's manual. An additional warning sticker should be placed on the unit.

# UNACCEPTABLE

**SUCTION**

## IMPACT MODEL 306 ASPIRATOR

**Impact Instrumentation, Inc.**
**P.O. Box 508**
**West Caldwell, NJ 07006**
**(800) 882-1212**

**Evaluation Date:** January 18 1991

**Description:** The Model 306M Programmable intermittent suction system represents the state of the art in portable suction apparatus. Electronic vacuum regulator - This circuit differs from conventional mechanical regulators in several ways. The regulator is eliminated from the vacuum path, is energy efficient; it only draws current proportional to the amount of vacuum required. Electronic intermittent suction circuits determine on and off times, selectable in 144 different combinations. Emergency battery - A sealed Lead acid (GEL cell) battery is provided for emergency and transitory use.

Sorry, no picture available.

**Power Requirements:** 120 VAC 60 - 400 Hz

**Comments:** Failed EMI testing.

# ACCEPTABLE

## SUCTION

## IMPACT MODEL 308M PORTABLE ASPIRATOR

**Impact Instrumentation, Inc.**
**P.O. Box 508**
**West Caldwell, NJ 07006**
**(800) 882-1212**

**Evaluation Date:** March 1 1985

**Description:** The Impact Model 308M is a portable aspirator capable of both oropharyngeal and tracheal suctioning. It is lightweight and comes enclosed in a self-contained polyethylene carrying case. The vacuum can be adjusted from 0 to 550 mmHg. By attaching the Impact 308M Intermittent Suction Timer Box, the Model 308M has intermittent suction capability.

Sorry, no picture available.

**Power Requirements:** 115 VAC 50 - 400 Hz, 2.0 amp, Internal Battery or External 12 VDC

**Comments:** We strongly suggest that users be instructed to keep the lid of the Impact open at all times when the unit is being used. A potential electrical hazard exists if the aspirate canister overflows from the exhaust port when the lid is closed.

CONDITIONAL

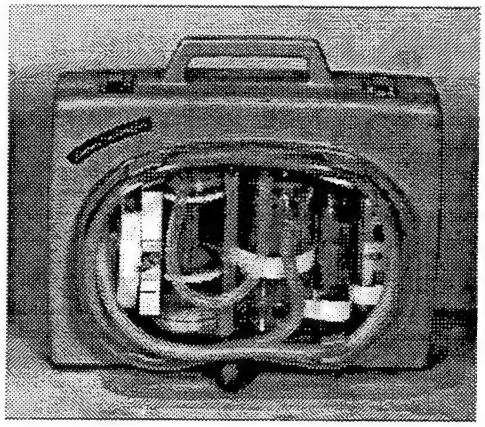
# SUCTION

# LAERDAL SUCTION UNIT, MODEL LSU

**Laerdal Medical Corp.**
**1 Labriola Court**
**Armonk, NY 10504**
**(800) 431-1055**

**Evaluation Date:** April 1 1990

**Description:** The Laerdal delivers continuous suction at two rates. At "Full speed", it will suction 500 ml of water in 3.0 to 5.0 seconds. At "Half speed", it will suction 500 ml in 3.5 to 5.5 seconds. Operating at "Full speed" on battery, the unit will operate up to approximately 1 hour; at "Half speed", up to approximately 2 hours. Actual operating time will vary with battery charge level, work load required, motor speed selection, and overall age and condition of unit.



**Power Requirements:** 110 VAC 60 Hz, 0.6 amp or Internal battery

**Comments:** The Laerdal was evaluated as a component of the neonatal Transport System. Due to electromagnetic interference, this unit may be used only when installed within the support structure of the system. **DO NOT USE THIS DEVICE OUTSIDE THE NEONATAL TRANSPORT SYSTEM. DOING SO COULD AFFECT THE AIRCRAFT COMMUNICATION OR NAVIGATION SYSTEMS.**

CONDITIONAL

**SUCTION**

# LAERDAL SUCTION UNIT, TRANSFORMER/RECTIFIER

**Laerdal Medical Corp.**
**1 Labriola Court**
**Armonk, NY 10504**
**(800) 431-1055**

**Evaluation Date:** December 1 1981

**Description:** The Laerdal suction unit (LSU) is a versatile emergency aspiratory which is effective for a wide range of medical applications. It features a high-vacuum, and high free air flow, and is well suited for oropharyngeal suction.

The LSU is typically used wherever central suction is not available. It can be used effectively in the field and/or ground transportation environments. The main components of the LSU are the power pack with controls, motor, pump, vacuum bottle and suction tubing.

Sorry, no picture available.

**Power Requirements:** Internal batteries or external 12 VDC (Rectifier/Transformer: 115 VAC 50 - 400 Hz. Battery can be charged on 400 Hz power, however, we do not recommend operation from 400 Hz.)

**Comments:** Based on the results of the tests conducted, the LSU with the EMI modified motor and the Transformer/Rectifier can be considered acceptable for use onboard aircraft used for aeromedical evacuation.

This unit only operates in a relatively high (594 mmHg) suction mode which is ideal for oronasopharynx suctioning. A lower and more closely controlled suction mode such as 150 mmHg (ECRI Journal Mar 1978 for a traumatic tracheal suctioning is available with the installation of a Wika Variable control regulator 793000). This unit has auxiliary bottles to augment the 480 ml bottle; however, to maintain adequate suction time, we do not recommend using suction containers which accumulate greater than 1300 cm.

**The Mascot 24/12 VDC converter, type 7413, emits excessive EMI and therefore cannot be considered acceptable for use onboard aircraft.**

# UNACCEPTABLE

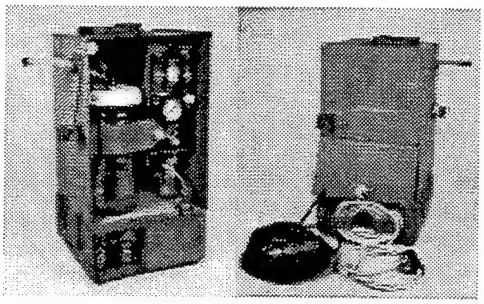
## SUCTION

## MEDICAL MULTIPURPOSE SUCTION PUMP (SUNDSTRAND) MODEL 77-500

**Sundstrand Aviation Mechanical**
**(Division of Sundstrand Corp.)**
**4747 Harrison Ave.**
**Rockford, IL 61101**
**(815) 226-6000**

**Evaluation Date:** April 1 1975

**Description:** Not available in record



**Power Requirements:** 115 VAC 60 - 400 Hz, Internal Battery or 28 VDC

**Comments:** Failed EMI Testing. The unit did pass all environmental tests including vibration and rapid decompression. In accordance with paragraph 4.23, Association for the Advancement of Medical Instrumentation (AAMI), Safe Current Limits Standard (April 1974), the Sundstrand vacuum pump is classified as equipment "likely to contact the patient." Table 4.3.1 of the standard indicates leakage current limits from chassis to ground shall not exceed 100 microamperes when the third wire (ground) of the 115 volts alternating current (VAC) power cable is open. The Sundstrand vacuum pump does not exceed the leakage current limits when the pump is operating from direct current power or from 115 VAC 60 Hz power. However, when the unit is operating from 115 VAC 400 Hz power and the third wire (ground) of the power cable is open, leakage current from chassis to ground exceeds the limits specified by the AAMI standard.

| CONDITIONAL | SUCTION |
|---|---|
| **MUELLER ASPIRATOR PUMP (CARMODY)** | **Manufacturer Unknown** |
| **Evaluation Date:** September 1 1972 | |

**Description:** Not available in record

Sorry, no picture available.

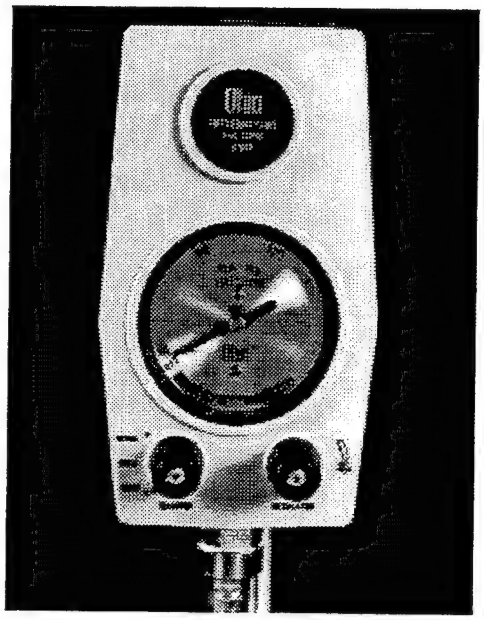
**Power Requirements:** 24 - 28 VDC

**Comments:** The Mueller Aspirator Pump (Carmody) was tested for EMI only and was found to exceed radiated and conducted emission limits specified by MIL-STD-461A. It is for interim use only and should not be used if an acceptable aspirator is available. A waiver was granted for the use of the unit on the aircraft.

| ACCEPTABLE | SUCTION |
|---|---|
| **OHIO INTERMITTENT SUCTION UNIT CATALOG #6704-1251-901** | **Ohmeda**<br>**P.O. Box 7550**<br>**Madison, WI 53707**<br>**(800) 345-2700** |

**Evaluation Date:** July 1 1976

**Description:** The Ohio Intermittent Suction Unit is a dual purpose (intermittent or continuous), non-electric vacuum unit. During the intermittent mode of operation, the ON and OFF time cycles are independently adjustable. They are preset at the factory to provide 15 seconds ON and 8 seconds OFF during each complete time cycle. This assures that the drainage will always tend to be moved away from the patient toward the collection bottle. An Allen wrench is provided with the unit to adjust the ON/OFF time cycle. Available vacuum from the unit is adjustable throughout the range of zero to 200 mmHg. The amount of vacuum present when the unit is adjusted to FULL VACUUM is dependent on the vacuum source.



**Power Requirements:** An external vacuum supply source provides power for the mechanical action of the unit. The unit will operate on line vacuums from approximately 300 mmHg to 740 mmHg.

**Comments:** Normally, when used inflight, the aircraft vacuum pump switch need not be turned on. However, minimum vacuum pressure for the unit to operate properly at sea level cabin pressure is at least 300 mmHg. Minimum vacuum pressure at 8,000 ft cabin pressure is a least 350 mmHg. To supply the required vacuum pressure the C-9A vacuum pump may have to operate throughout the entire flight. To use the Ohio when the aircraft is on the ground, the vacuum pump switch must be turned on. Currently, only the C-9A aircraft can accommodate the unit.

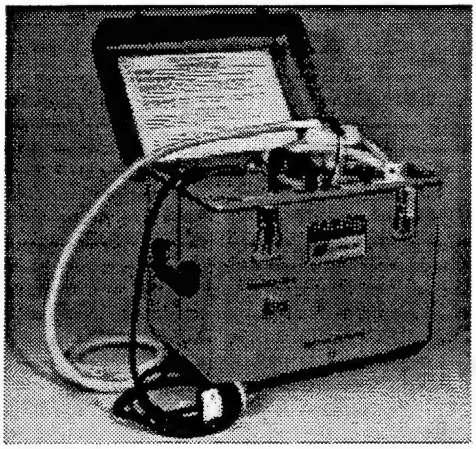
# ACCEPTABLE

## SUCTION

## PORTABLE TRACHEAL ASPIRATOR (PROTOTYPE)

**Novatek, Inc.**
**79R Terrace Hall Ave.**
**Burlington, MA 01803**

**Evaluation Date:** January 1 1979



**Description:** The unit is capable of producing adjusted vacuum levels up to 500 mmHg and flow rates of 25 liters per minute. Access to operating controls, the collection bottle, and patient suction tube is provided by a top opening, removable hinged cover.

**Power Requirements:** For field use, an internal battery is provided that makes the unit fully operable without external power. The unit will also operate from 28 VDC. An external battery charger module is provided to recharge the battery from 117 VAC. The battery can also be recharged while plugged into 28 VDC.

**Comments:** 117 VAC, 28 VDC or Internal Battery The Portable Tracheal Aspirator passed all environmental tests, including vibration, rapid decompression and electromagnetic compatibility (EMC).

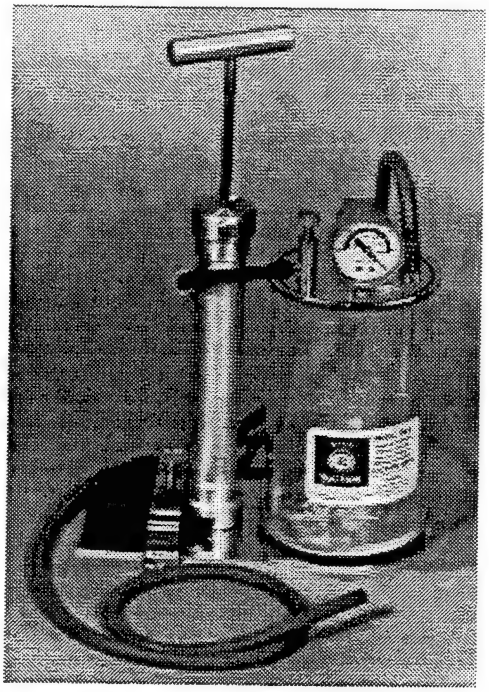
# ACCEPTABLE

## SUCTION

## RICO MODEL RS-6 FIXED/PORTABLE SUCTION SYSTEM

**Rico Suction Labs Inc.**
**306 Greenwood Ave.**
**Burlington, NC 27215**
**(919) 584-1826**

**Evaluation Date:** June 1 1976



**Description:** The Rico Model RS-6 Fixed/Portable Suction System provides continuous vacuum and is effective in oropharyngeal and tracheobronchial suctioning procedures. When operated correctly, the unit can provide in excess of 600 mmHg vacuum. When the tubing is open, it can provide a free air flow rate of 30 liters per minute. This unit will operate from the ambulance engine vacuum or double-acting hand pump. When the hand pump is used to operate the unit, performance will be dependent upon the dexterity and strength of operator.

**Power Requirements:** None

**Comments:** None

| UNACCEPTABLE | SUCTION |
|---|---|
| **S-SCOR PORTABLE SUCTION** | **Manufacturer Unknown** |

**Evaluation Date:** March 1 1987

**Description:** Not available in record

Sorry, no picture available.

**Power Requirements:** 115 VAC 60 Hz

**Comments:** Suction unit. Failed EMI testing. File had no manufacturer information available, only EMI results. No description of unit or manufacturer brochure of unit.

CONDITIONAL

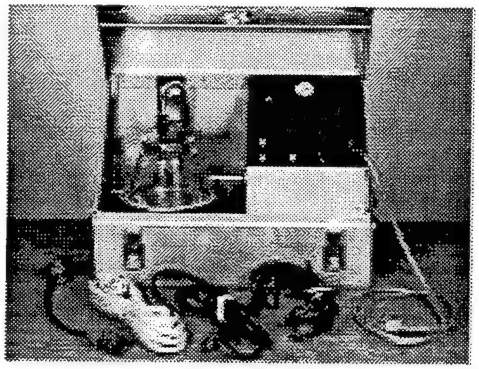
# SUCTION

## SAM MULTIPURPOSE VACUUM PUMP (SMVP)

**Sundstrand Aviation**
**(Division of Sundstrand Corp.)**
**4747 Harrison Ave.**
**Rockford, IL 61101**
**(815) 226-6000**

**Evaluation Date:** March 1 1975

**Description:** Not available in record



**Power Requirements:** 115 VAC 60 - 400 Hz, 28 VDC or Battery

**Comments:** The unit passed all environmental tests including vibration, rapid decompression, and electromagnetic compatibility (EMC). The School of Aerospace Medicine pump does not exceed the leakage current limits specified by Air Force Regulation 160-3, Atch 3, when the unit is operating from 115 VAC, 60 Hz power with the third wire (ground) of the power cable open. When the unit is operating from 115 VAC 400 Hz power and the third wire (ground) of the power cable is open, leakage current from chassis to ground exceeds the limits specified. In this mode, unit should not be operated near an electrically susceptible patient.

# AEROMEDICAL RESEARCH STATUS GUIDE

## VENTILATORS

- BABYBIRD INFANT VENTILATOR, MODEL 5900
- BEAR 2 ADULT VOLUME VENTILATOR
- BEAR 33 VOLUME VENTILATOR
- BEAR MODEL INFANT CUB VENTILATOR
- BENNETT MODEL MA-1, VENTILATOR
- BIO-MED DEVICES P-7 ADULT VENTILATOR, SN 0298204
- BIO-MED INFANT VENTILATOR, MODEL MVP-10
- BIRD MARK 7A
- BIRD MARK 10 VENTILATOR
- BIRD MARK 14 VENTILATOR
- BIRD VENTILATOR UNIT (IMV BIRD, NEONATE URGENCY BIRD, OXYGEN BLENDER
- BOURNS BP200 INFANT PRESSURE VENTILATOR
- FLYNN SERIES III VENTILATOR WITH OXYGEN POWERED ASPIRATOR
- IMPACT UNI-VENT 750 VENTILATOR
- INSPIR AID VA-1 VENTILATOR
- LIFE CARE PLV 100 VENTILATOR
- LIFE CARE PLV 102 VENTILATOR
- MILESTONES, PNEU/PACK VENTILATORS
- MILITARY TRANSPORT RESPIRATOR, MODEL TXP
- MONAGHAN 225 VOLUME VENTILATOR
- NEWPORT, E100i VENTILATOR
- OHMEDA LOGIC 07 VENTILATOR
- PENLON TRANSPORT VENTILATOR
- PORTABLE VOLUME CONTROL RESPIRATOR (PVCR) (PROTOTYPE)
- PURITAN-BENNETT CHEMICAL OXYGEN POWERED SINGLE PATIENT COMBAT VENTILATOR
- ROBERTSHAW DUAL CYLINDER PORTABLE RESUSCITATOR
- SAMSON NEONATAL RESUSCITATOR
- SEARLE VA ADULT VOLUME VENTILATOR, POWER PACK, SEARLE AUTOWEDGE
- SPIROMETER, TIDAL HUMIDIFIER
- SIEMENS-ELEMA 900B SERVO VENTILATOR
- STEIN-GATES OMNI-VENT VENTILATOR
- URGENCY BIRD REDUCED FOR NEONATES

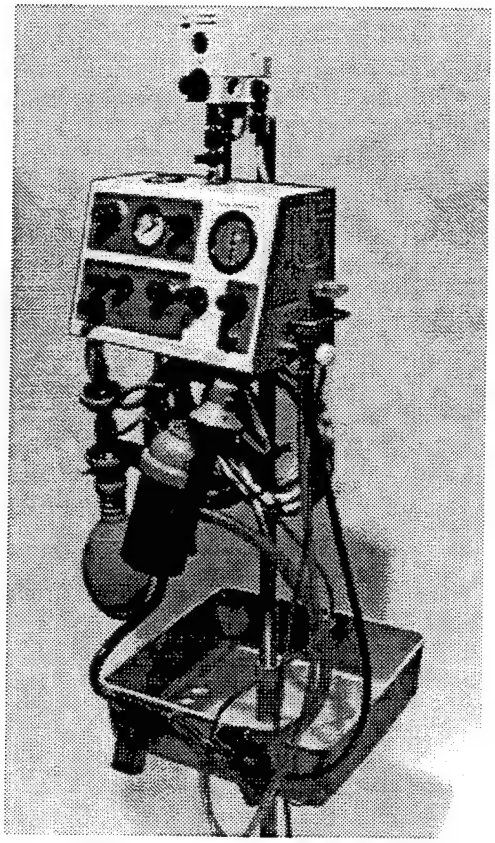
# ACCEPTABLE

## VENTILATORS

## BABYBIRD INFANT VENTILATOR, MODEL 5900

**3M/Medical Products Division**
**P.O. Box 2007**
**3101 E. Alejo Rd.**
**Palm Springs, CA 92262**
**(800) 227-7540**

**Evaluation Date:** June 1 1979



**Description:** Not available in record

**Power Requirements:** Oxygen 50 psi and compressed air 50 psi

**Comments:** The Babybird ventilator, Model 5900, operated satisfactorily from ground level to 34,000 ft equivalent altitude. The airway pressure at the test lung varied with simulated altitude changes, with rapid decompression causing the greatest change in airway pressure. A pressure relief valve in the airway line reduced the effects of rapid decompressions. The breaths per minute delivered by the Babybird decreased with an increase in equivalent altitude. The oxygen concentrations at the numbered mixer settings remained relatively constant at ground level and 8,000 ft equivalent altitude. Results of temperature tests indicate the ventilator cannot be operated at ambient temperatures below 4 degrees C (40 degrees F).

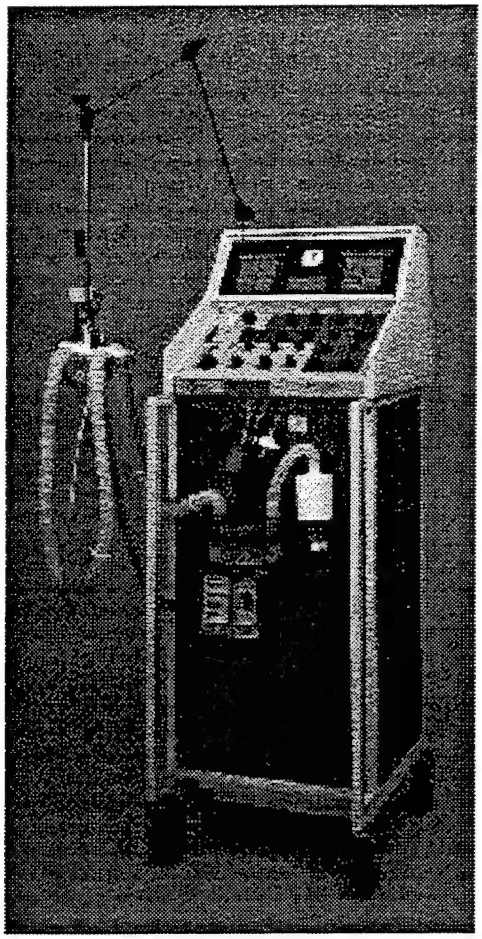
# UNACCEPTABLE

## VENTILATORS

## BEAR 2 ADULT VOLUME VENTILATOR

**Bear Medical Systems, Inc.**
**9340 Narina Dr.**
**Riverside, CA 92503**
**(714) 788-2560**

**Evaluation Date:** June 1 1984



**Description:** The Bear 2 Adult Volume Ventilator features four integral modes of ventilation: Control, Assist Control, SIMV and CPAP. It provides demand flow principle for spontaneous breathing, leak compensation, 0-120 cmH2O peak inspiratory pressure, 0-50 cmH2O of PEEP, 10-120 LPM peak flow, and a wide array of audible/visual alerts and alarms.

**Power Requirements:** 117 VAC, 60 HZ

**Comments:** Unacceptable for use based on the results of failure during EMI testing.

CONDITIONAL

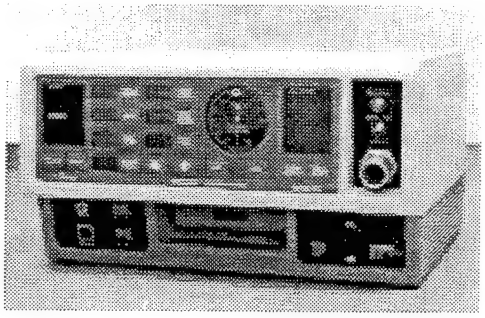
# VENTILATORS

# BEAR 33 VOLUME VENTILATOR

**Bear Medical Systems**
**2085 Rustin Ave.**
**Riverside, CA 92507**
**(800) 232-7633 & (714) 788-2460**

**Evaluation Date:** June 1 1989

**Description:** The Bear 33 is a highly versatile and truly portable adult volume ventilator. Only 20.32 cm (8 inch) high on litter mounting sled, it easily fits on the NATO litter for aeromedical evacuation use. Features include: Digital readout; control, assist control and SIMV modes of ventilation; visible and audible alarm; dedicated meters for both external and internal batteries on the front panel for easy visibility of charge status; oxygen accumulator for enriched oxygen delivery; PEEP compatible for 0-20 cm of water; a tamper resistant panel lock that automatically relocks in 15 seconds; non-interchangeable drive lines preventing misconnection; a test button that allows a quick check of displays and the integrity of the LCDs. It also includes a humidifier, Model LS 420.



**Power Requirements:** 120 VAC 60 Hz, 1.5 amp or 12 VDC internal battery

**Comments:** The Bear 33 was tested and approved for use on the C-9A, C-130, and C-141B aircraft. The ventilator is NOT approved for use on any aircraft where an external power supply (AC power) is unavailable. The internal battery should only be used as a back-up power supply. The humidifier has no internal battery, and is powered only by 120 VAC 60 HZ. An inline oxygen monitor should always be used with the Bear 33. The audible alarms cannot be heard inflight, and the ventilator should be positioned so that the visual alarms can be seen. Though not tested, and therefore not found acceptable, The Bear 33 can also accommodate a 12 VDC external battery. On the C-130 and C-141 aircraft, the Bear 33 may be powered by the Vanner Power Inverter Model SP 00112. However, the Bear Humidifier Model LS 420 MAY NOT be powered by the Vanner.

# UNACCEPTABLE

## VENTILATORS

## BEAR MODEL INFANT CUB VENTILATOR

**Bear Medical Systems**
**2085 Rustin Ave.**
**Riverside, CA 92507**
**(800) 232-7633 & (714) 788-2460**

**Evaluation Date:** January 12 1983

**Description:** Not available in record.

Sorry, no picture available.

**Power Requirements:** Not recorded

**Comments:** Testing was terminated. Failed EMI testing.

# UNACCEPTABLE

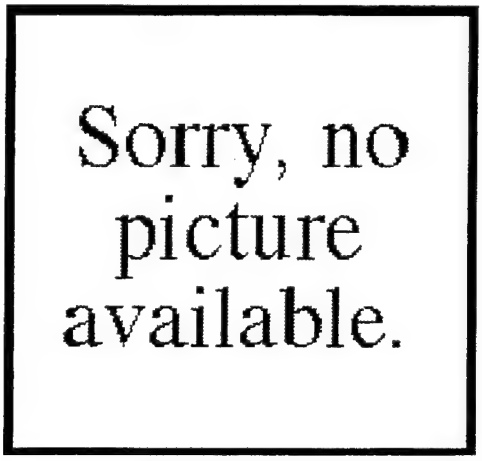
## VENTILATORS

## BENNETT VENTILATOR MODEL MA-1

**Bennett Respiration Products, Inc.**
**1639 Eleventh Street**
**Santa Monica, CA 90406**

**Evaluation Date:** April 6 1972

**Description:** Not available in record




**Power Requirements:** 115 VAC, 60 Hz

**Comments:** Excessive EMI. Failed rapid decompression test. The Bennett Model MA-1, Respiration Unit is unacceptable for use on aeromedical airlift. The MA-1 possesses electromagnetic interference with exceeds MIL-STD 461A and 462; components, printed circuit boards, pumps and valves are not sufficiently secured to withstand prolonged aircraft vibrations; provides no means of securing to the aircraft; the AC line is not fused; operates at 115 VAC, 60 Hz only; and, electrical leakage current will not allow use with electrically susceptible patients. Environmental testing of the Model MA-1 has not been performed. Electromagnetic interference from the units alarms can probably be eliminated. It must be kept in mind the Bennett MA-1 does not exceed EMI limits during operation without tripping the alarm circuits.

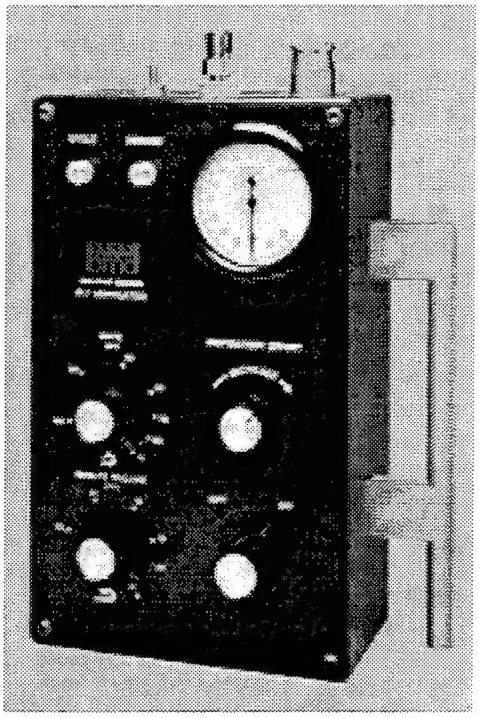
# UNACCEPTABLE

## VENTILATORS

## BIO-MED DEVICES P-7 ADULT VENTILATOR, SN 0298204

**Bio-Med Devices Inc.**
**2 Selleck Street**
**Stampford, CT 06902**
**(203) 348-0888 & (203) 245-8765**

**Evaluation Date:** May 1 1986



**Description:** The Bio-Med P-7 is a compact, pneumatically operated adult ventilator. It is a volume controlled ventilator that provides control, assist/control, and mandatory modes of operation. The breath rate can be adjusted from approximately 14 to 63 breaths per minute (BPM). The minute volume can be adjusted up to a maximum of 24 liters per minute.

**Power Requirements:** 50 psi, medical grade breathing air

**Comments:** Excessive intrapulmonary peak pressure and tidal volume at altitude. Decreased rate at altitude.

CONDITIONAL

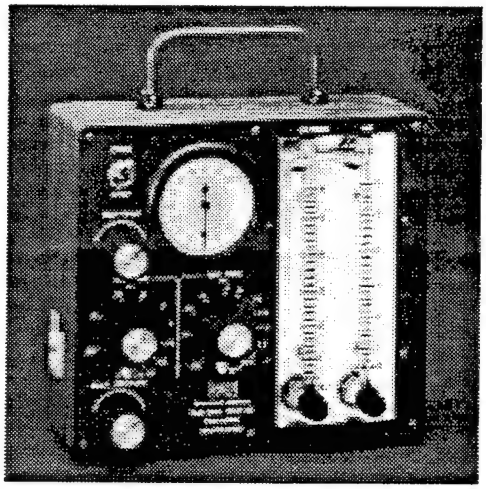
# VENTILATORS

## BIO-MED INFANT VENTILATOR MODEL MVP-10

**Bio-Med Devices Inc.**
**2 Selleck Street**
**Stampford, CT 06902**
**(203) 348-0888 & (203) 245-8765**

**Evaluation Date:** April 1 1990

**Description:** Not available in record



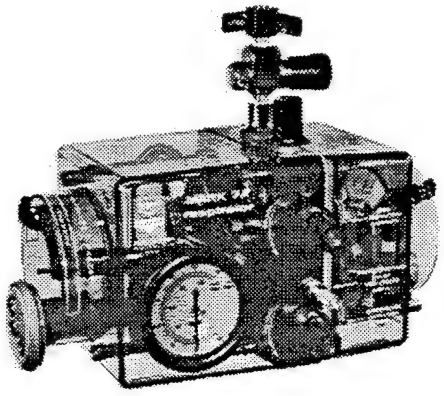
**Power Requirements:** 50 ± 5 psi oxygen/compressed air

**Comments:** The MVP-10 was evaluated as a component of the International Biomedical Neonatal Transport System. The ventilator, designed specifically for neonatal use, is difficult to operate at altitude, because the ventilator parameters require constant monitoring and frequent adjustments. Controls that require adjustment in response to altitude changes are inspiratory time, expiratory time and pressure. In most cases, it is recommended that an approved oxygen/air blender be used to deliver the required gas mixture to the patient. In some cases for gas conservation, such as when used on the C-21 aircraft, it may be more beneficial to NOT use a blender, but to connect the gas lines directly to the ventilator. In either case, the decision will be made by the neonatology team member operating the ventilator. It is strongly recommended that an approved oxygen monitor be used inline with the ventilator breathing circuit to measure the percentage of inspired oxygen. it is recommended that breathing circuits specifically designed by Bio-Med Devices be used with the MVP-10. During rapid decompression testing from 10,000 to 40,000 ft, the internal valves became inoperable. They resumed operation when altitude was restored to 16,000 ft. Due to this operational limitation, the MVP-10 is approved for aeromedical use, only if accompanied by a neonatology team member who would be available to manually ventilate the infant, if required. **May be used only as a component of the Neonatal Transport System, and operated by a trained neonatology team member.**

| ACCEPTABLE | VENTILATORS |
|---|---|
| **BIRD MARK 7A** | **3M/Medical Products Division**<br>**P.O. Box 2007**<br>**3101 Alejo Rd.**<br>**Palm Springs, CA 92262**<br>**(619) 327-1571** |

**Evaluation Date:** February 1 1987

**Description:** The Bird Mark 7A respirator is a pneumatically powered, flow adjustable, pressure/time cycled assistor/controller.



**Power Requirements:** O2 Source

**Comments:** None

# ACCEPTABLE

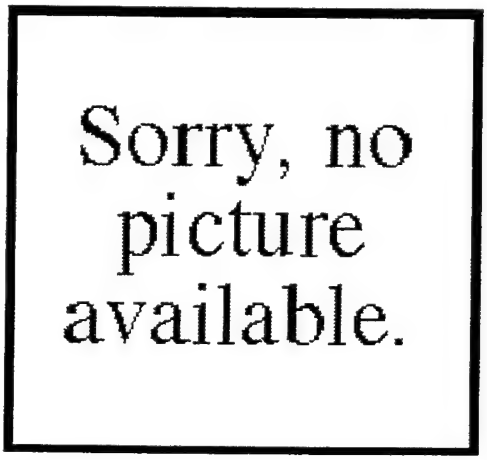
## VENTILATORS

## BIRD MARK 10 VENTILATOR

3M/Medical Products Division
P.O. Box 2007
3101 Alejo Rd.
Palm Springs, CA 92262
(619) 327-1571

**Evaluation Date:** January 1 1967

**Description:** The Bird Mark 10 ventilator is an automatic assistor-controller, pressure-cycled ventilator with a high range of versatility. It possesses the absolute requirement of pressure, flow, timing, and phasing, and has the very desirable terminal flow accelerator to compensate for leaks. The oxygen percentage delivered is stated to be 40-60%, depending on flow, but it may run somewhat higher. To deliver near 100% oxygen, one must flow oxygen over the air intake filter. The Bird Mark 10 ventilator is compact, lightweight, and operates in any position, and in extremes of temperature. Its function is not appreciably altered by moderate decrease in atmospheric pressure.




**Power Requirements:** O2 Source

**Comments:** None

| ACCEPTABLE | VENTILATORS |
|---|---|
| **BIRD MARK 14 VENTILATOR** | **3M/Medical Products Division**<br>**P.O. Box 2007**<br>**3101 Alejo Rd.**<br>**Palm Springs, CA 92262**<br>**(619) 327-1571** |

**Evaluation Date:** August 1 1975

**Description:** The Bird Mark 14 is an extended range, leak compensating, positive phase respirator. It provides airway pressure up to 70 mmHg and flow rates up to 200 liters per minute. It is acceptable for use onboard aeromedical evacuation aircraft by similarity. It is equivalent to the Bird Mark 10, except that it has higher airway pressure and low rate capabilities.

Sorry, no picture available.

**Power Requirements:** O2 Source

**Comments:** None

# UNACCEPTABLE

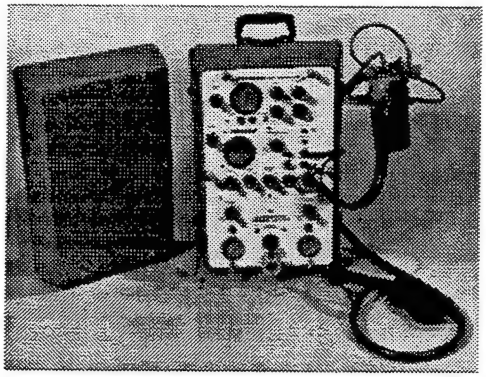
## VENTILATORS

## BIRD VENTILATOR UNIT (IMV BIRD, NEONATE URGENCY BIRD, OXYGEN BLENDER

**Bird Corporation**
**Mark 7 Respirator Lane**
**Palm Springs, CA 92262**
**(714) 327-1571**

**Evaluation Date:** November 1 1977

**Description:** All controls are located on the face of the respirators and on the main case. The air and oxygen gauges are, also, located in this area. The connections for the air and oxygen hoses are located on the left side of the main case. Support studs are located on both the upper and lower surfaces of each side and support the accessory brackets that hold the humidifier and aspirator. A snap-on plastic cover is provided to protect the face of the unit during storage and transport. Two compressors are available to provide compressed air to the respirators. One is powered from a 115/60Hz source; the other, a 28 VDC power source. Each compressor has three individual compressor motors. Battery Pak and Charger are in one case. A carrying handle is provided on top of the case. Unit consists of IMV Bird, neonate urgency bird and oxygen blender. Both respirators can be operated simultaneously or alone.



**Power Requirements:** Medical gas source 45-55 psi and 115 VAC 60 Hz or 28VDC

**Comments:** Failed EMI testing.

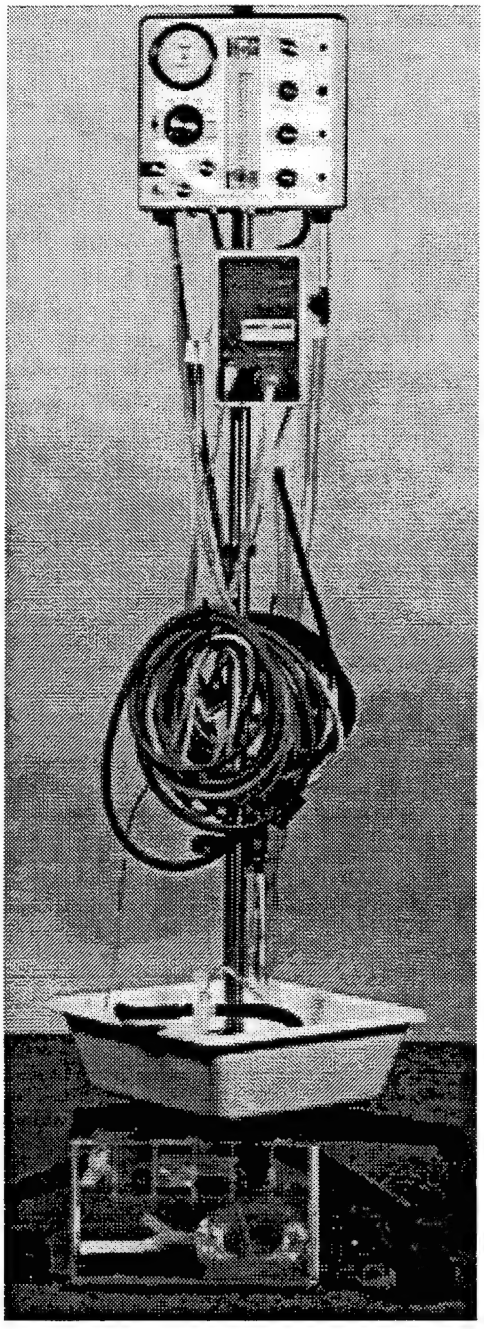
# UNACCEPTABLE

## VENTILATORS

## BOURNS BP200 INFANT PRESSURE VENTILATOR

**Bourns Life Systems**
**9335 Douglas Dr.**
**Riverside, CA 92503**
**(714) 781-5062**

**Evaluation Date:** June 1 1979



**Description:** The Bourns BP200 Infant Pressure Ventilator is a pneumatically operated, electronically controlled, time cycled device. It is a constant or continuous flow generator which functions as a controller. The ventilator can provide zero end expiratory pressure (ZEEP), positive end expiratory pressure (PEEP), continuous positive airway pressure (CPAP), intermittent mandatory ventilation (IMV), or an inspiratory plateau. During all modes of operation, the amount of delivered pressure can be limited by adjustment of the pressure limit control.

**Power Requirements:** 115 VAC, 60 Hz, O2, and compressed air

**Comments:** Based on the results of the tests conducted, the ventilator cannot be considered acceptable for use onboard aircraft because of the following reasons:

(1) Measured broad and narrow band emissions, both radiated and conducted, exceeded the limits of MIL-STD 461A at many frequencies.

(2) Airway pressure fluctuations and temperature alarm problems were encountered during the low and high temperature tests.

(3) Excessive airway pressures were exhibited in the 1 sec rapid decompression test.

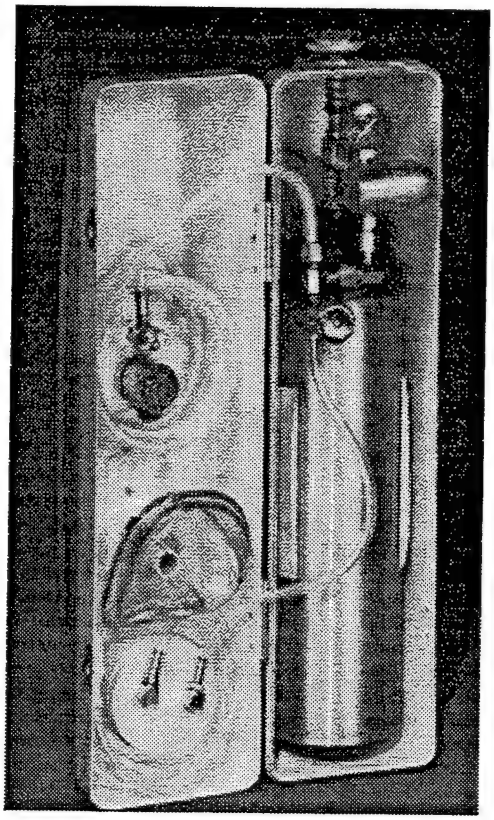
# ACCEPTABLE

## VENTILATORS

## FLYNN SERIES III VENTILATOR WITH OXYGEN POWERED ASPIRATOR

**Marion Health and Safety, Inc.**
**(O-Two Systems)**
**3703 N. Main**
**Rockford, IL 61101**
**(800) 387-3405 & (815) 877-2531**

**Evaluation Date:** August 1 1976



**Description:** The Flynn Series III Ventilator is an effective and dependable method to administer oxygen in an emergency situation. It may be used safely for both adults and children. On the military model, the pressure relief valve is preset to 80 cm H2O in the ADULT mode and 40 cm H2O in the CHILD mode.

**Power Requirements:** 50 psi O2 Source

**Comments:** Previously tested as the Marion-Flynn Ventilator with oxygen powered aspirator.

# UNACCEPTABLE

## VENTILATORS

## IMPACT UNI-VENT 750 VENTILATOR

**Impact Instrumentation, Inc.**
**P.O. Box 508**
**27 Fairfield Place**
**West Caldwell, NJ 07006**
**(201) 882-1212**

**Evaluation Date:** March 31 1991

**Description:** The Impact Uni-vent 750 is a portable, electronically controlled, time-cycled, pressure limited ventilator. It is controlled by an on-board microprocessor which continuously monitors the patients airway pressure, all control settings, alarm parameters and power signals. It can provide ventilatory support in Control, Assist-control, SIMV modes. Each mode is operable with or without sigh. The Impact 750 does not consume gas for operating power.

Sorry, no picture available.

**Power Requirements:** Internal, rechargeable batteries; 11-30 V AC/DC, 50-400 Hz

**Comments:** Testing on prototype was completed in 1988. Testing on production model not completed and unit has not been approved for use.

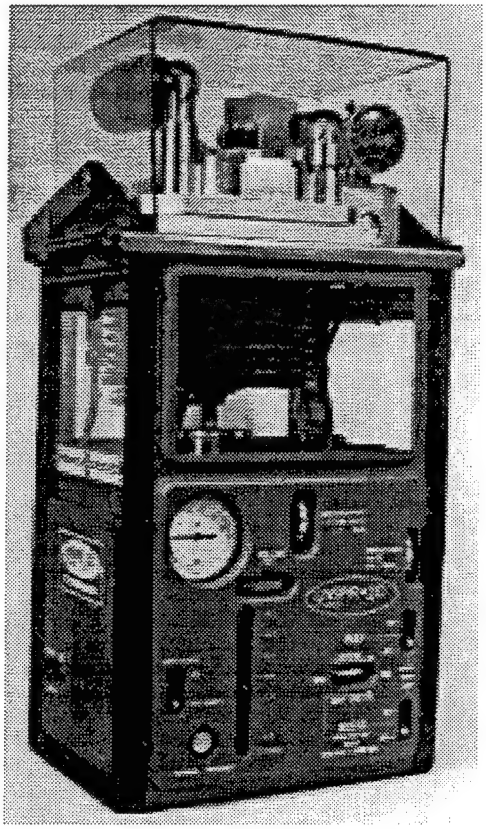
# UNACCEPTABLE

## VENTILATORS

## INSPIR AID VA-1 VENTILATOR

**Aaron Ismach Developments**
**(AID DEVICES)**
**200 Upper College Terrace**
**Frederick, MD 21701**
**(301) 662-8753**

**Evaluation Date:** October 1 1980



**Description:** The AID-VA-1 Ventilator is a complete function volume cycled device stressing low weight and cube, mechanical ruggedness, and excellent gas economy. it is primarily designed for use as a transport ventilator,, but being full function device it can be employed in the hospital. No electrical power source is required for operations. The driving gas used for powering the ventilator need not be of breathing quality. The AID-VA-1 Ventilator is an automatic device which may be used as a controller or an assistor-controller, with or without positive end expiratory pressure. (PEEP). If desired the unit may be annually cycled. Oxygen concentration up to 100% are achieved by use of the Model 4201 Robert Shaw Demand Valve, incorporated in the ventilator. The demand O2 regulator in the air-oxygen mixing system may be independently used for applying manually triggered emergency resuscitation. The AID-VA-1 Ventilator has the capability for an accessory aspiratory by employing ventilator driving gas as the power source.

**Power Requirements:** 9 Volt Battery and Pneumatic positive pressure-compressed air, therapeutic oxygen, nitrogen, etc. from 40-125 psi at 7.5 liter/minute

**Comments:** Not clinically approved. (Prototype)

# UNACCEPTABLE

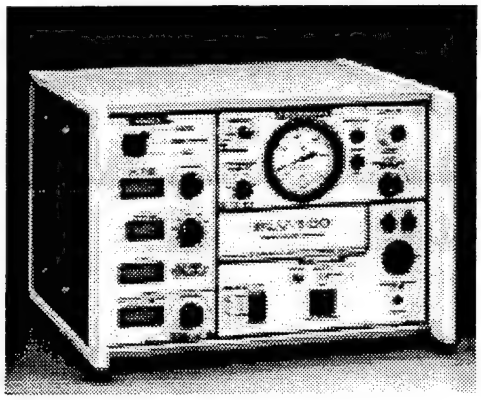
## VENTILATORS

## LIFE CARE PLV 100 VENTILATOR

**Lifecare**
**8042 El Rio**
**Houston, TX 77054**
**(303) 666-9234 & (800) 669-9234**

**Evaluation Date:** October 1 1991

**Description:** The Lifecare PLV 100 is a portable volume cycled ventilator. The PLV 100 incorporates an all solid state microprocessor based control system and offers Controlled, Assist/Control and SIMV ventilation. This unit monitors patient breathing rate in both assist/control and SIMV modes by averaging the sum of patient-assisted and mandatory breaths. Pressure relief is accomplished when the pressure limit is reached by venting the excess gas internally. Inverse I:E ratios are allowed. Tidal volume as low as 50 cc and an optional pressure-limit valve are available for pediatric applications. The alarm system is comprised solely of an audible warning.



**Power Requirements:** 120 VAC 50 - 60 Hz, 2.5 amp, 12 VDC internal battery,

**Comments:** 12 VDC external battery (not tested).

CONDITIONAL

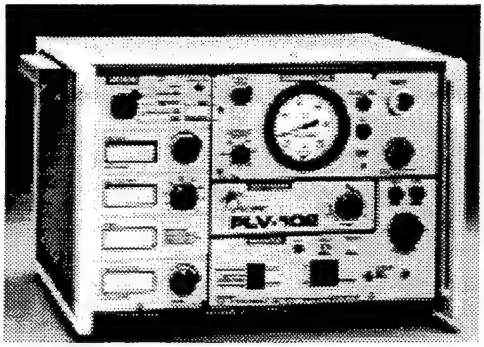
# VENTILATORS

## LIFE CARE PLV 102 VENTILATOR

**Lifecare**
**8042 El Rio**
**Houston, TX 77054**
**(303) 666-9234 & (800) 669-9234**

**Evaluation Date:** August 28 1992

**Description:** The Lifecare PLV 102 is a portable volume cycled ventilator. The PLV 102 incorporates an all solid state microprocessor based control system and offers Controlled, Assist/Control and SIMV ventilation. This unit monitors patient breathing rate in both assist/control and SIMV modes by averaging the sum of patient-assisted and mandatory breaths. Pressure relief is accomplished when the pressure limit is reached by venting the excess gas internally. Inverse I:E ratios are allowed. Tidal volume as low as 50 cc and an optional pressure-limit valve are available for pediatric applications. The PLV 102 ventilator offers O2 enrichment from a compressed gas source, 50 psig oxygen, and is adjustable from 21% to 90%. Oxygen is delivered in all modes, on inspiration only. The PLV 102 has an audible alarm and an alarm code is displayed in the flow LCD window.



**Power Requirements:** 120 VAC 50 - 60 Hz , 2.5 amp, 115 VAC 400 Hz, 12 VDC external battery or 12 VDC internal battery

**Comments:** External Battery not tested. The modified unit passed all of our testing. Modified unit must have AF identifier on it, noting Aerovac approved. Waiver was granted from ASC/ENACE, Wright-Patterson for 400 Hz power. Recommend an inline oxygen sensor be used during flight.

| UNACCEPTABLE | VENTILATORS |
|---|---|
| **MILESTONES, PNEU/PACK VENTILATORS** | **Bear Medical Systems, Inc.**<br>**9340 Narnia Dr.**<br>**Riverside, CA 92503**<br>**(714) 788-2460** |

**Evaluation Date:** December 31 1986

**Description:** Not available in record

Sorry, no picture available.

**Power Requirements:** Not recorded

**Comments:** Not all tests were completed on the pneu/PAC ventilators. See record for history. Tested units were: Child-Adult

CONDITIONAL

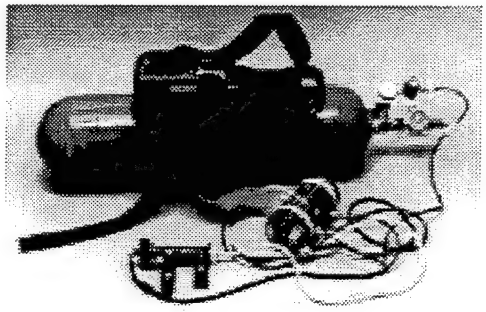
# VENTILATORS

# MILITARY TRANSPORT RESPIRATOR, MODEL TXP

**Bird Space Technology**
**Bird Airlodge**
**P.O. Box 817**
**Sand Point, ID**
**(208) 263-7824**

**Evaluation Date:** August 1 1989

**Description:** The TXP's small size, lightweight design, and fully pneumatic operation make it ideal for rapid transport use. It is a time-cycled respirator designed with a minimum of controls and features. A non-indexed ventilation rate control knob and two push button controls, for delivering manual inspiratory and expiratory breaths, are all the control features located on the ventilator. Delivered tidal volumes are controlled by adjusting the source gas pressure. A mechanical respirometer, Ohmeda part #220-1800-600, and manual breath count are used to measure delivered volumes and breath rate. A positive end expiratory pressure (PEEP) valve attachment was tested with the respirator and provides PEEP of 1 to 15 cm of water. A composite cylinder, Structural Composite Industries part #1270152-3, and pressure reduction regulator, Ohmeda part #A-50197 are used by the burn team. The cylinder and pressure regulator are carried strapped to the back of a team member using a scuba diver oxygen tank harness.



**Power Requirements:** 20 to 60 pounds per square inch oxygen or air.

**Comments:** This TXP was tested specifically for use by the U.S. Army Institute of Surgical Research, Burn Flight Team at Fort Sam Houston, Texas. This system is approved for use in a one-on-one clinical relationship where constant qualified medical surveillance is provided. The composite cylinder is approved by the Department of Transportation (DOT) for use in a mobile environment. Based on the manufacturer's extensive testing on the cylinder, the DOT approval, and the burn team's years of usage with no signs of degradation, we recommend the cylinders for use in aeromedical transport. For further information on the burn team's operational experience with the TXP, potential users may consult with the U.S. Army Institute of Surgical Research, Burn Flight Team at Fort Sam Houston TX; telephone (512) 221-2943, DSN 471-2943. **For use on aeromedical evacuation aircraft, The TXP cylinder MUST be fitted with a pressure relief valve to prevent over pressurization.**

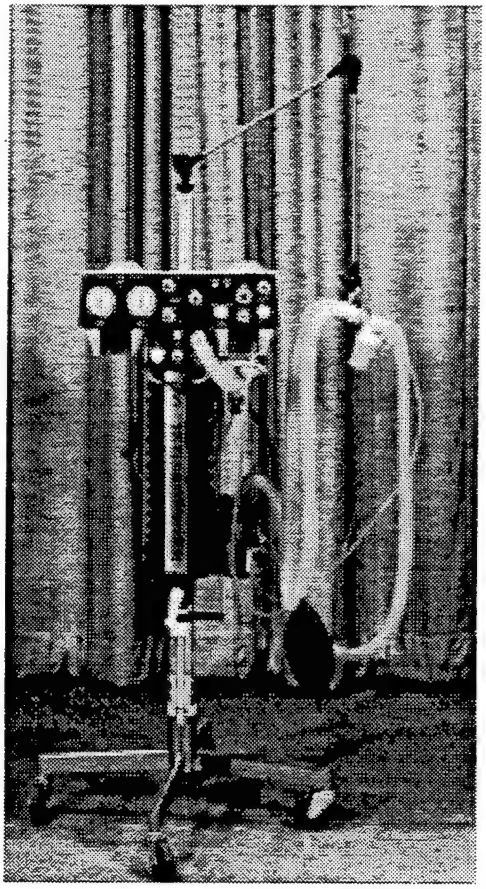
# UNACCEPTABLE

## VENTILATORS

## MONAGHAN 225 VOLUME VENTILATOR

**Monaghan, A Division of Sandoz, Inc.**
**4100 East Dry Creek Rd.**
**Littleton, CO 80122**
**(303) 770-2700**

**Evaluation Date:** August 1 1976



**Description:** The Monaghan 225 Volume Ventilator may be operated as a volume, pressure, or time-cycled unit. Its principal of operation is fluidic. Power is supplied to the unit by a 50 psig 100% oxygen source. The unit provides the capability to assist, assist/control, or control the respiratory effort. All controls are located on the face of the unit and are clearly marked. The tidal volume cylinder encases the bellows. the crank, used to adjust tidal volume, is located at the bottom and external to the compartment bellows. tidal volumes of 100 - 3300 ml may be selected. Operation of the bellows is assisted by gravitational force. The 610 inline nebulizer saturates the delivered gas and provides for control of humidity relative to body temperature.

**Power Requirements:** 50 psig O2 and a 115 VAC 60 Hz - Nebulizer

**Comments:** Fluidic components are adversely affected by changes in ambient pressure.

| UNACCEPTABLE | VENTILATORS |
|---|---|
| **NEWPORT E100i VENTILATOR** | **Newport Medical Instruments, Inc.**<br>**P.O. Box 2600**<br>**Newport Beach, CA 92658**<br>**(714) 642-3910** |

**Evaluation Date:** January 1 1992

**Description:** Not available in record

Sorry, no picture available.

**Power Requirements:** 50 psi air and oxygen, 120 VAC 60 Hz

**Comments:** Ventilator, gas and electrical powered. Required air and oxygen. A detailed description not given since testing was not completed. The item was sent back to the company because it did not meet our specifications. EMI testing was completed, but no other tests were done. The company did not appear to be interested in making the necessary changes to pass our testing. Not acceptable for use.

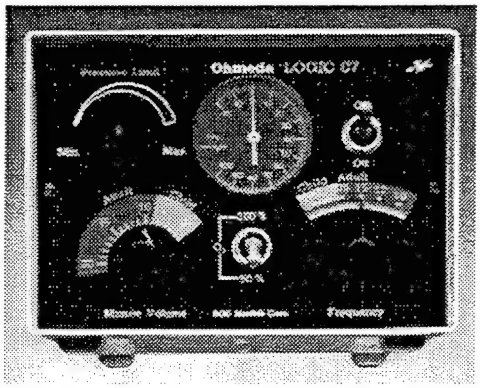
# UNACCEPTABLE

## VENTILATORS

## OHMEDA LOGIC 07 VENTILATOR

Ohmeda, B.O.C. Group Inc.
Ohmeda Dr.
Madison, WI 53707-7550
(800) 345-2700

**Evaluation Date:** November 14 1986




**Description:** Not available in record

**Power Requirements:** O2 Source

**Comments:** Evaluation testing was discontinued. See record for history.

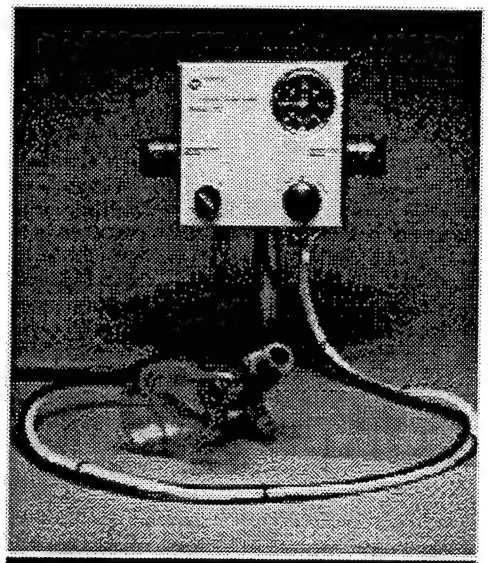
# UNACCEPTABLE

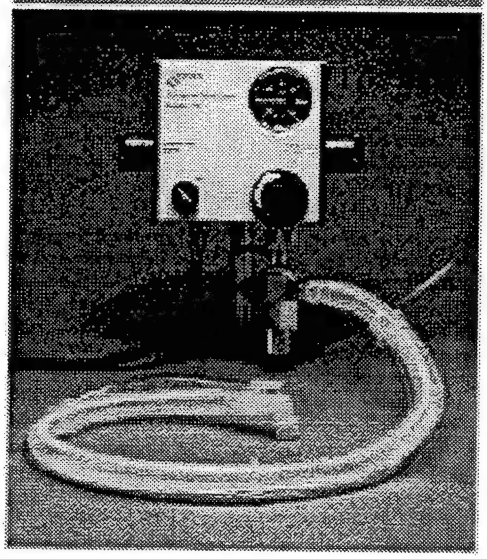
## VENTILATORS

## PENLON TRANSPORT VENTILATOR

**Bear Medical Systems, Inc.**
**9340 Narnia Dr.**
**Riverside, CA 92503**
**(714) 788-2460**

**Evaluation Date:** December 9 1986





**Description:** Not available in record

**Power Requirements:** O2 Source

**Comments:** Altitude evaluations were conducted in Feb. 85, with an apparent failure. There is no record of correspondence with the manufacturer. No other testing was accomplished. See record for history.

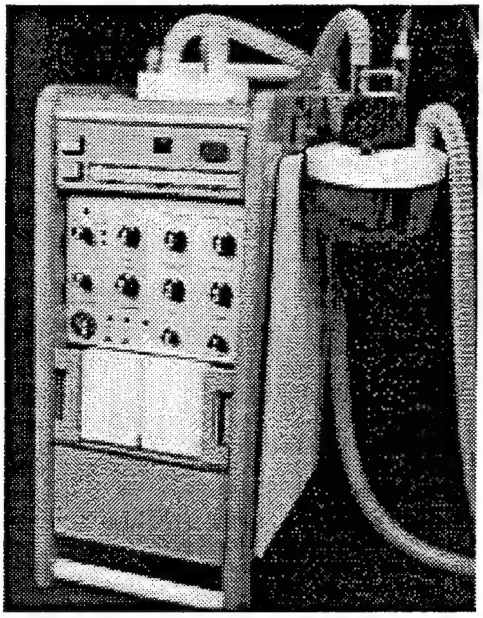
# UNACCEPTABLE

## VENTILATORS

## PORTABLE VOLUME CONTROL RESPIRATOR (PVCR) (PROTOTYPE)

**General Electric Re-entry & Environmental Systems Division**
**3198 Chestnut Street**
**Philadelphia, PA 19101**
**(215) 823-2035**

**Evaluation Date:** May 1 1978



**Description:** The Portable Volume Control Respirator (PVCR) provides the capability to deliver a selected volume of 0.2 to 2 liters of air/oxygen mixture in either the open or closed cycle mode of operation. It may be operated from a 115 VAC 50 -400 Hz, 28 VDC, or internal Ni-Cad battery pak power source. Oxygen is provided to the unit from either an internal or external oxygen source. The internal oxygen bottle is ball-shaped and holds 1900 psi. It will provide oxygen to the PVCR for 10 minutes in the open cycle or for four hours in the close cycle mode of operation. During close cycle mode of operation, the respired gases are continually recirculated through the closed loop formed by the patient and the respirator system with carbon dioxide being removed by a rechargeable soda lime scrubber and consumed oxygen being replenished from the internal oxygen bottle. The close cycle mode provides for periods of at least four hours automatic operation.

The control panel contains settable controls for power source, PO2, Tidal Volume (TV), airway pressure limit, mode of operation, PEEP, exhale time, inhale flow rate, sigh ON-OFF, and assist ON-OFF. A transparent cover over the controls prevents inadvertent shifting of the controls. The AC/DC circuit breakers are located on the rear of the unit. They MUST NOT be pulled our manually. This can cause damage to the unit. In addition, the ventilator ON/OFF push button should be turned off prior to discontinuing power to the unit; otherwise, the alarm system will be activated. The AC and DC power cords are located on the rear of the unit and have an external storage area located there.

**Power Requirements:** 115 50 - 400 Hz, 28 VDC or Internal Ni-Cad battery

**Comments:** From the results of the test performed and the failure to be able to complete the entire test program due to continued equipment malfunction. The device is unacceptable for use in the aeromedical environment. The PVCR was developed under a U.S. Navy contract. The production units may or may not be fabricated by General Electric.

# UNACCEPTABLE

## VENTILATORS

## PURITAN-BENNETT CHEMICAL OXYGEN POWERED SINGLE PATIENT COMBAT VENTILATOR

**Puritan-Bennett Corp.**
**(Puritan-Bennett Aero Systems Co.)**
**10800 Pflumm Rd.**
**Lenexa, KS 66215**
**(816) 421-2122**

**Evaluation Date:** December 1 1985

**Description:** The Single Patient Combat Ventilator (SPCV) is a prototype ventilator intended to provide artificial ventilation to nerve agent casualties during transport to a fixed facility. The SPCV is a portable, compact ventilator that can be powered from either its own chemically generated oxygen source or from an external oxygen supply. The chemically generated oxygen is produced within a pressure vessel by the decomposition reaction of sodium chlorate materials. The pressure vessel will operate the ventilator for a nominal 17 minutes. The ventilator has two preset frequencies: (1) Normal, which provides 8-12 breaths per minute BPM, including positive end expiratory pressure (PEEP) for ventilation through an endotracheal tube or oronasal mask, and (2) High, which provides 60 BPM for ventilation through a cricothyroid catheter.

Sorry, no picture available.

**Power Requirements:** Internal chemical oxygen generator, pressure vessel or External oxygen source, 50-95 psi, medical grade.

**Comments:** Failed Altitude testing. The pressure vessel was not tested, per the requesting authority (AMD/RDSX). The SPCV was evaluated for use while operating on an external air supply only. No testing was accomplished with the unit operating from its own chemically generated oxygen source. Therefore, the operation, safety and maintainability of the chemical generator were not evaluated.

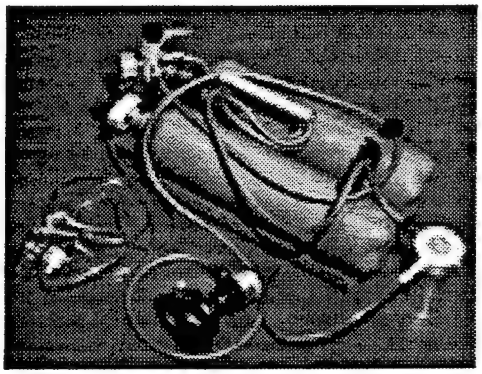
CONDITIONAL

# VENTILATORS

# ROBERTSHAW DUAL CYLINDER PORTABLE RESUSCITATOR

**Robertshaw Controls Company**
**333 North Euclid Way**
**Anaheim, CA 92803**
**(714) 996-6700**

**Evaluation Date:** October 1 1975



**Description:** The Robertshaw Dual Cylinder Portable Resuscitator is used to provide emergency respiratory treatment when respirations have ceased or have been compromised by trauma and/or disease. It can function as a respirator, a resuscitator, and/or aspirator. Replacement of the aspirator unit by an additional Demand Valve allows the unit to be used to provide ventilation to two patients simultaneously.

**Power Requirements:** O2 Source

**Comments:** If utilized in a pressurized aircraft where a decompression could occur, the operator must release the manual control button so that the patient can exhale to reduce the probability of lung trauma.

| ACCEPTABLE | VENTILATORS |
|---|---|
| **SAMSON NEONATAL RESUSCITATOR** | **Manufacturer Unknown** |
| **Evaluation Date:** November 1 1975 | |

**Description:** The Samson Neonatal Resuscitator is a disposable unit. Oxygen concentrations of over 90% are consistently delivered by the resuscitator when supplemental oxygen of 6 liters per minute or greater is fed into the unit.

Sorry, no picture available.

**Power Requirements:** Not recorded

**Comments:** None

# UNACCEPTABLE

## VENTILATORS

## SEARLE VA ADULT VOLUME VENTILATOR & POWER PACK AUTOWEDGE SPIROMETER TIDAL HUMIDIFIER

**Searle Cardio-Pulmonary Systems, Inc.**
**P.O. Box 8068**
**Emeryville, CA 94662**

**Evaluation Date:** November 1 1975

**Description:** The ventilator unit, which was evaluated, consisted of the Searle VA adult volume ventilator with stand, the Searle autowedge spirometer, and tidal humidifier, and the power pack. The Adult volume ventilator with stand and casters is 15 3/4" deep, 16 3/4" wide, 38 1/2" high, and weighs 88 pounds. With the addition of the power pack, the unit weighs 145 pounds.

Sorry, no picture available.

**Power Requirements:** 115 VAC 60 Hz, Vent. Power pack and humidifier - 115 VAC, 60 - 400 Hz.

**Comments:** Failed EMI, cold temperature operation and humidity testing. Vibration testing not done, record indicates unit probably would not pass test. For airborne use, the equipment does not have a means of securing to the aircraft other than the lower part of the stand.

# UNACCEPTABLE

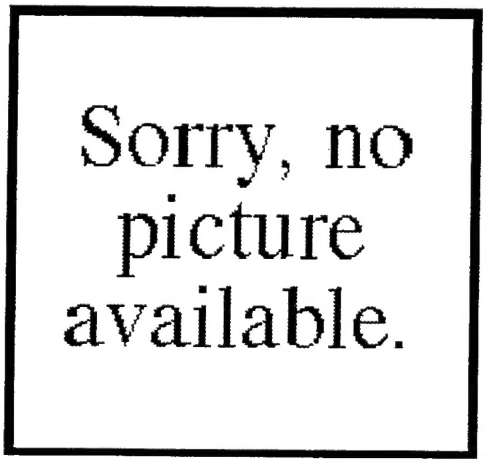
## VENTILATORS

## SIEMENS-ELEMA 900B SERVO VENTILATOR

Siemens Corporation
Ventilator Products
P.O. Box 554
Union, NJ 07083
(201) 9964-0575

**Evaluation Date:** June 1 1979

**Description:** The Servo Ventilator 900B is an electronically controlled lung ventilator. It can be set for volume generated or pressure generated ventilation either controlled or assisted. It consists of an electronic and pneumatic module and has a ventilatory range from neonates to adults. The ventilator can be set to deliver positive end expiratory pressure (PEEP), continuous positive airway pressure (CPAP), and intermittent mandatory ventilation (IMV). The Air/Oxygen blender has selectable oxygen percentages from 21-100% and connects to the compressed air inlet on the right side of the pneumatic unit.




**Power Requirements:** 100 VAC 60 Hz, Compressed air and therapeutic oxygen

**Comments:** Failed EMI testing, erratic readings from unit controls during vibration tests significant sensitivity to high humidity and varying temperatures. Excessive peak airway pressure during rapid decompression.

# UNACCEPTABLE

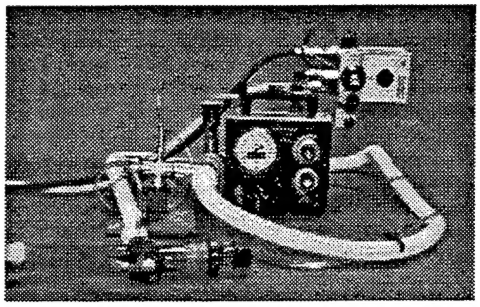
## VENTILATORS

## STEIN-GATES OMNI-VENT VENTILATOR

**Stein-Gates Medical Equipment, Inc.**
**121 North Fourth Street**
**Atchison, KS 66002**
**(913) 367-3945**

**Evaluation Date:** June 18 1987

**Description:** Time cycle, volume constant ventilator. No further summary available. See record for further information



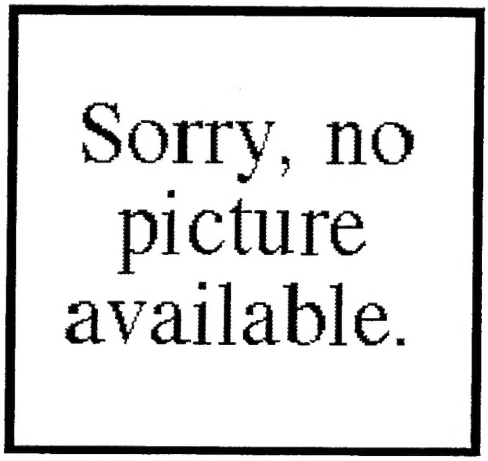
**Power Requirements:** Air/oxygen 40-140 psi

**Comments:** None

| ACCEPTABLE | VENTILATORS |
|---|---|
| **URGENCY BIRD REDUCED FOR NEONATES** | **3M/Medical Products Division**<br>**P.O. Box 2007**<br>**3101 Alejo Rd.**<br>**Palm Springs, CA 92262**<br>**(619) 327-1571** |

**Evaluation Date:** November 1 1977

**Description:** Time cycled, pneumatically driven unit that requires both an oxygen and compressed air power source.




**Power Requirements:** Oxygen and compressed gas

**Comments:** The Urgency Bird reduced for neonates is acceptable for aeromedical evacuation use.